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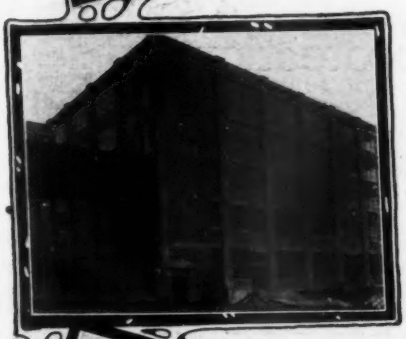

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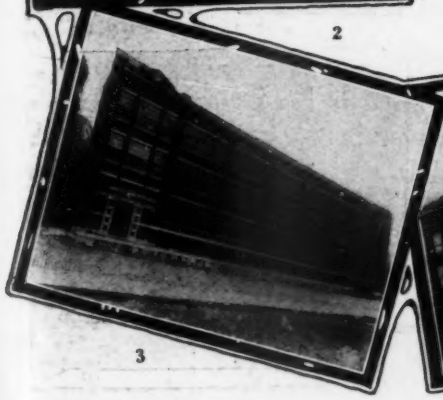

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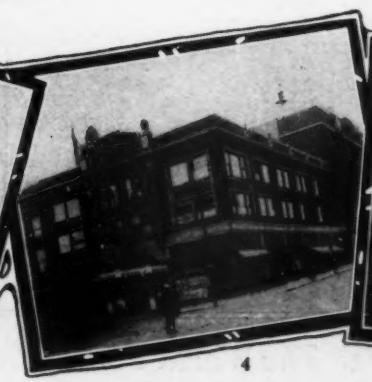

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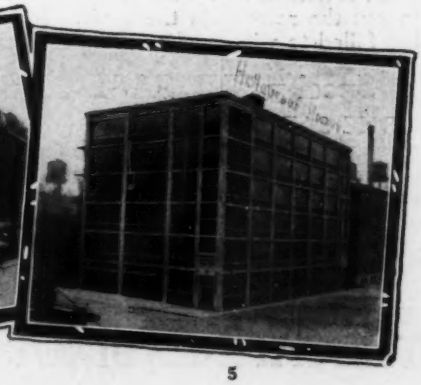

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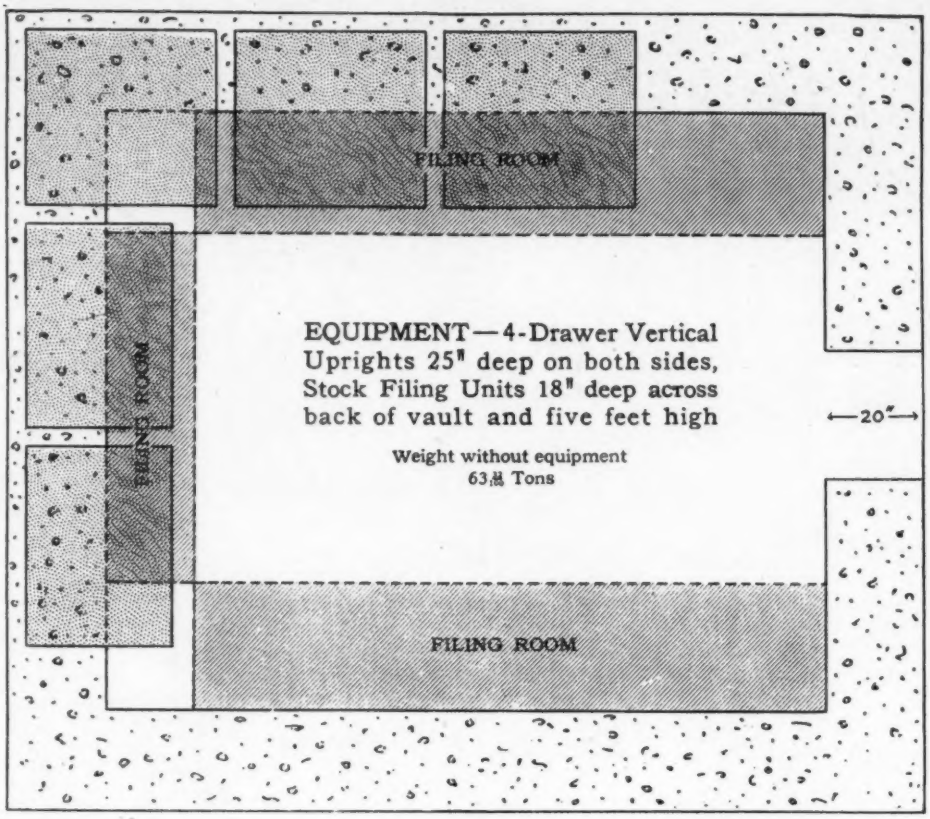
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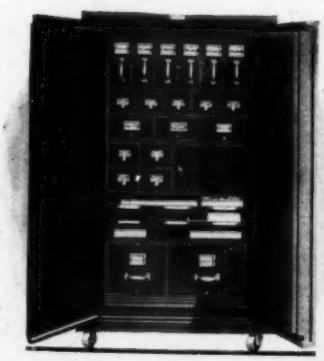

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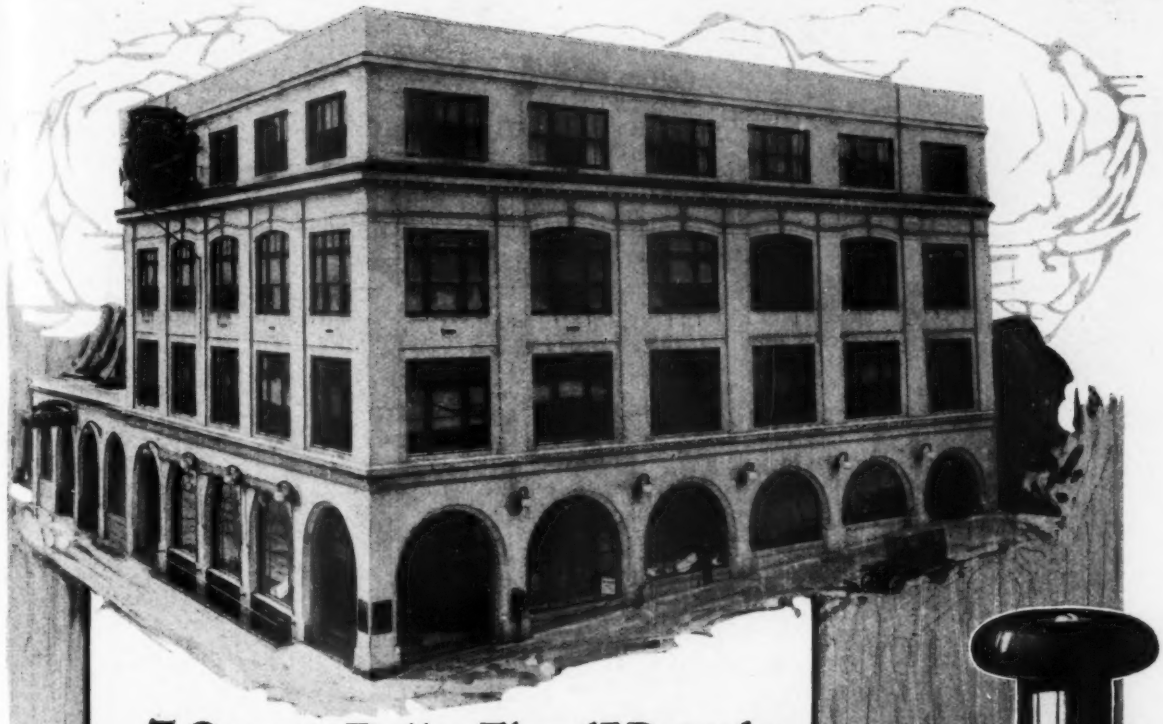

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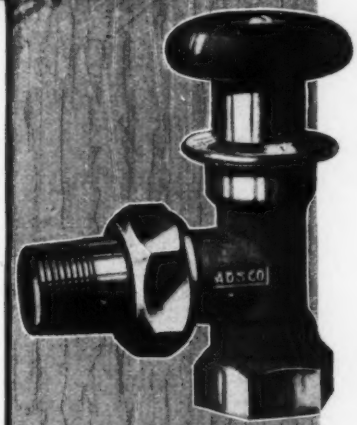

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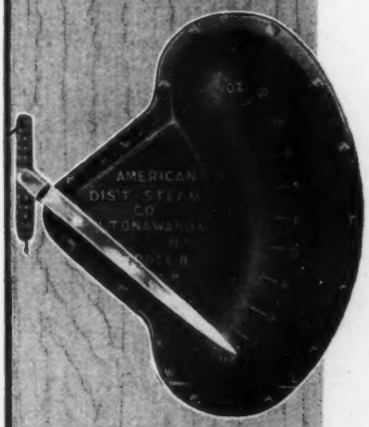

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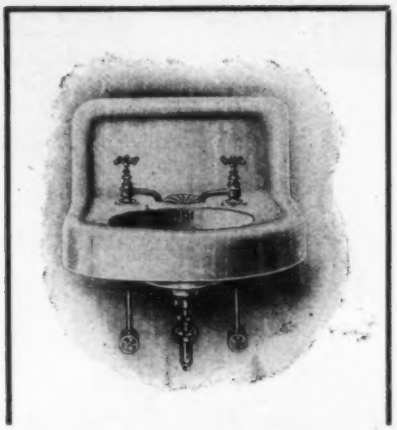

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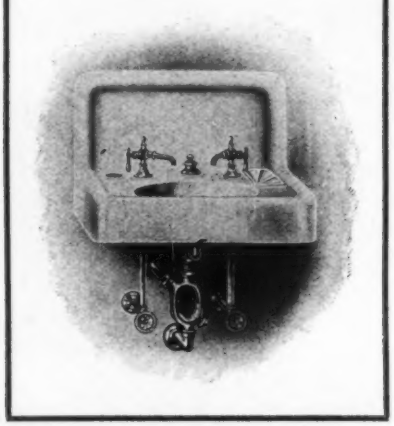

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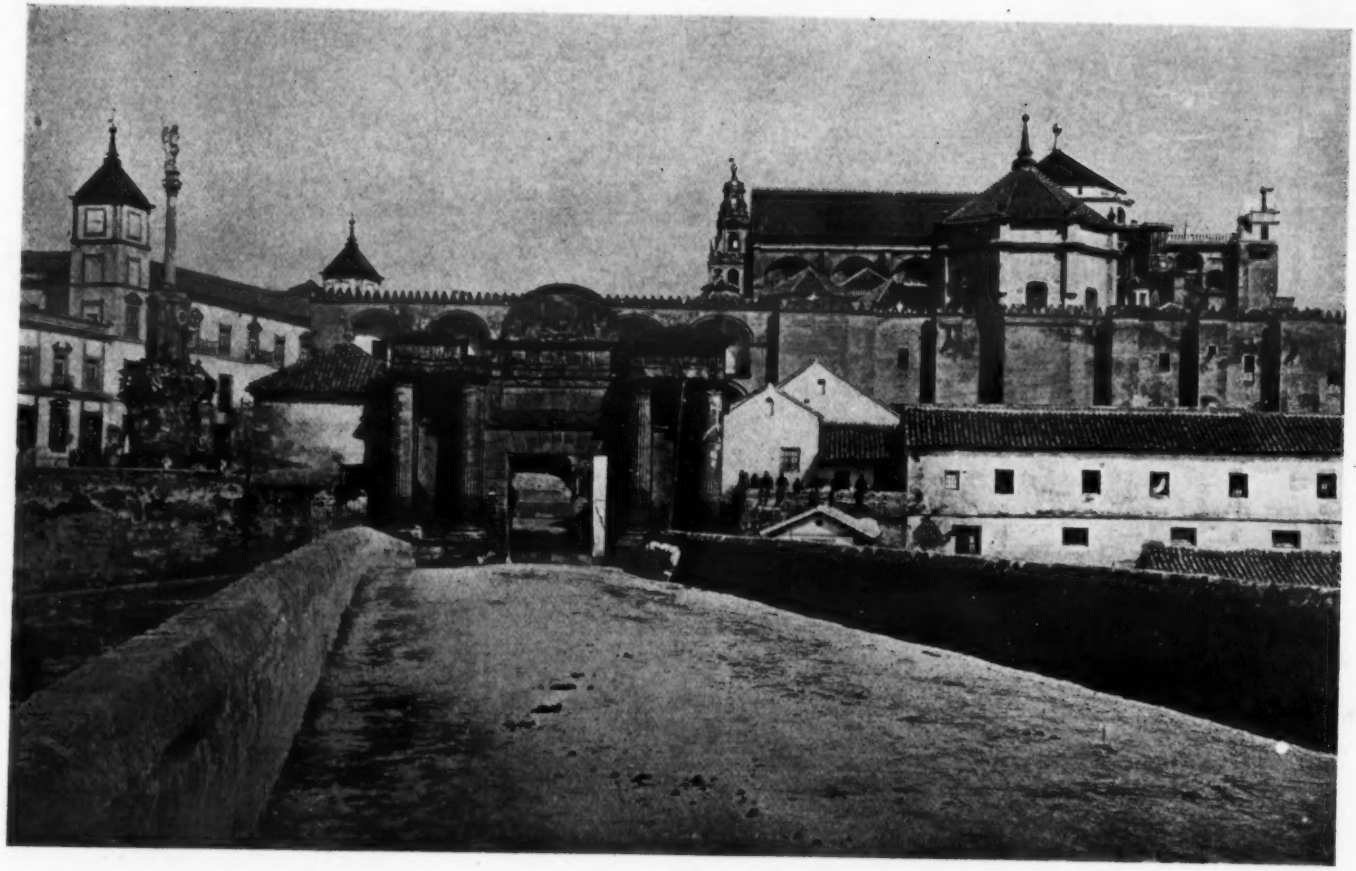

THE CITY GATE, CORDOBA

THE AMERICAN ARCHITECT

VOL. CXVII WEDNESDAY, MARCH 3, 1920 NUMBER 2306

The Foundations of Classic Architecture*

BY WM. H. GOODYEAR, M. A., CURATOR OF THE DEPARTMENT OF FINE ARTS
HON. MEMBER SOCIETY OF ARCHITECTS OF ROME; HON. MEMBER OF EDINBURGH ARCHITECTURAL ASSOCIATION; HON. MEMBER ROYAL ACADEMY OF FINE ARTS OF MILAN; HON. ACADEMICIAN ROYAL ACADEMY OF VENICE; CORRESPONDING MEMBER AMERICAN INSTITUTE OF ARCHITECTS

PROFESSOR HERBERT LANGFORD WARREN (1857-1917) had been, at the time of his death, for many years Dean of the Faculty of Architecture of Harvard University. His book on The Foundations of Classic Architecture is a posthumous work, edited by Fiske Kimball, Professor of Art and Architecture in the University of Virginia, who has supplied an introduction, and selected most of the illustrations, but has otherwise published the text substantially as left in manuscript by Professor Warren, with the exception of the concluding twenty-eight pages relating to the Parthenon and the Erechtheum, which were lacking to the otherwise finished manuscript. It appears from Professor Kimball's Introduction that Professor Warren had planned for many years a work on the general history of architecture, of which this was to be a portion, but it also appears, both from the Introduction and from an examination of the book itself, that it is a complete unit for the subject of Greek Architecture, and the preceding architecture of Egypt and Mesopotamia. Hence the choice of the title, The Foundations of Classic Architecture, which appears quite properly to cover the subject matter of the book.

Professor Kimball's Introduction includes an interesting biography of Professor Warren, from which we learn that he was born in Manchester, England, although of New England Colonial ancestry on the father's side; that his school days were passed in Manchester, aside from two years (1869-71) in the gymnasia of Gotha and Dresden; that from 1871-1875 he studied at Owen's College, Manchester, and after entering the office of a Manchester architect, came to this country in 1876. After studying architecture from 1877-1879 under Professor William R. Ware at the Massachusetts Institute of Technology, he entered the office of H. H. Richardson, and remained there from 1879-1884. In this office he was in close relations with its distinguished head, and when he left his employ in 1884 it was to travel in England, Italy and France. In 1885 he began independent practice in Boston, and also had an office in Troy, N. Y. In 1886 and 1887 he was attached to the editorial staff of "The Sanitary Engineer," but continued to practice architecture as a member of the firm of Warren, Smith and Biscoe; subsequently the firm of Warren and Smith, which continued until his death. Although in later years he maintained a connection with the practice of his profession, he was able to give but little time to its actual pursuit, on account of the demands on his time as an administrative officer in Harvard University, and as a distinguished teacher there of his art. In 1893-94 he served as instructor; from 1894-1899 as assistant professor; from 1899-1903 as professor, and from 1903 to his death as Nelson Robinson, Jr., Professor of Architecture. He also lectured on architectural history at the Massachusetts Institute of Technology. At the time of his death he had completed nearly twenty-five years of faithful service to the University.

Thus, among the well known features of Professor Warren's career are his distinction as Dean of the Architectural School of Harvard University, his notable attainments and eminent connections as a professional architect, and his long experience and high reputation as an educational lecturer on the History of Architecture. To these points we may add the serious importance of his various contributions to the literature of the subject in the way of magazine and dictionary articles (which are mentioned in the Introduction of the present work).

All these things would lead to the conclusion that any book which Professor Warren had carefully planned and carefully written would be of great interest and importance. On the other hand let it be remembered that the ground covered by this book has been traversed again and again by the

* The Foundations of Classic Architecture, by Herbert Langford Warren, A.M., Late Fellow of the American Institute of Architects, and Dean of the Faculty of Architecture of Harvard University. Illustrated from Documents and Original Drawings. The Macmillan Company, Publishers, New York, MCMXIX. 8vo. Pages XIV-357. 126 illustrations. Price, $6.00.

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most distinguished architectural historians of the nineteenth and twentieth centuries. Several of these historians are American and English authors whose books are comparatively recent, whose abilities in the matter of literary style and expression have been excellent, whose knowledge of the literature of the subject left nothing to be desired, and whose acquaintance with the original monuments had been intimate and thorough.

Thus, a new book which travels over such familiar ground as the history of architecture in Egypt, Mesopotamia and Greece must be judged not only on its own merits, but also in relation to the merits of its very excellent and numerous predecessors, some of them of quite recent date. The present reviewer was consequently somewhat startled by his own favorable first impressions of Professor Warren's book, which appeared to him to be not only the last, but also the best, of its kind. These impressions have been confirmed by a reconsultation of the most notable preceding works of its class.

Although it is naturally impossible to say anything absolutely new about Egyptian art as a reflex of Egyptian environment, character and history, when we consider what French and German authorities have contributed to this subject, it is the present reviewer's opinion that there is not in the English language an equally readable, sympathetic, thorough, well-digested and artistically projected summary of the subject. Its treatment rises to the rank of inspiration. In the first chapter of his book, which is devoted to Egypt (70 pages), Professor Warren thus establishes his claim to be considered not only as an excellent architectural authority, but also as an eloquent and sympathetic student of the philosophy of history.

What has just been said of the Egyptian chapter is equally true of those which follow—Mesopotamia (in 28 pages); Persia (in 15 pages); the Aegean, i.e., the Cretan and Mycenaean period (in 27 pages); and Greece (156 pages).

In these later chapters, as in the first, Professor Warren's thought and the language used to express it leave nothing to be desired. The style is worthy of the subject. The arrangement of the matter is logical and equally praiseworthy for its selection of the important monuments and for its omission of the less important. It is a constant experience that the multiplication of facts in books tends to confuse and overload the memory. The great merit of this book is that it will not overtax the mind of the reader who is new to the subject.

This result is obtained by restricted and careful selection in the choice of subject matter, combined with a readable, flowing, eloquent and agreeable style of presentation. In compendious books we must generally contend with a density of style which makes them hard reading—a density which is due to the effort to cover much ground in a limited space. Professor Warren's happy faculty of grasping and projecting his subject as a whole has enabled him to achieve by wise omissions which are not at all prejudicial to his book, but on the contrary rather assist it, the results usually obtained through condensation. Space is thus available for picturesque descriptions, incidental local color and glimpses of the historic or local background. Above all space is available, and is taken, for the statement of both sides of the case when debatable points are in question, for the balancing of evidence, and for the presentation of the independent views and personal arguments of the writer, which almost invariably commend themselves as sane and reasonable. For instance, there is no other equally careful and convincing treatment in the literature of the subject, of the question as to the origin of the Doric style in timber construction. In other cases, as in the downward dating to the late sixth century of the Temple of Corinth, which used to be regarded as the oldest Greek temple ruin, the author shows himself to be an independent and original authority.

As to the special subject of Greek architecture the reviewer holds that there is no book in the English language which contains an equally careful, circumstantial, explicit and sympathetic account of the details of the Doric Order, and this is especially true of the Doric shaft. Following the introductory account of the Greek Doric Order and its details, the method followed by Professor Warren is especially successful because it consists of a series of local descriptions with appropriate illustration and restorations, of each important temple ruin, in its present condition and present surroundings; these descriptions being arranged according to the order of date. Thus is achieved an orderly sequent history of the subject, which is relieved and brightened by local color, and also by interesting details of local history. As a result of this arrangement, and because many of the Sicilian temples belong to the earlier or earliest dates, they are given an amount of emphasis and space which does not always fall to their lot, and which they undoubtedly deserve. At this point and in this particular it is proper to emphasize a feature which makes Professor Warren's book an indispensable part of every architectural library, viz., the circumstantial details derived from the recent Sicilian and Italian surveys of Koldewey and Puchstein.* Up to 1899 our only authority for Sicily was practically Hittorff and Zanth, *Architecture Antique de la Sicile*,

*Die Griechischen Temple in Unteritalien und Sicilien (1899).

dating in the first edition as far back as 1827, and dating in the second edition to 1870.

According to the method followed by Professor Warren the sequent history of the Doric style closes with the Temple of Zeus at Olympia, completed about 456 B. C. The next matter is a description of the Ionic Order and its origins, which is immediately followed by an account of the Athenian monuments, both Doric and Ionic (omitting the Ionic temples of Asia Minor which are known only by literary record). This account closes the book.

It does not appear to the reviewer that any other book on the subject of Greek architecture has achieved the artistic climax of leading up to, and closing with the Parthenon, which Professor Warren has obtained by thus following the order of time in which the surviving Greek temples were built, and combining with this arrangement an account of their local surroundings and their local history. What could offer a better climax than an account of the Parthenon and the Erectheum? Professor Kimball deserves great credit for his completion of the text for these buildings. It is a worthy counterpart in style, thought and method of the rest of the book. Although the temples of the Corinthian Order which belonged to the Alexandrian period were also Greek, as a matter of course, it so happens that none of their ruins have been sufficiently preserved to allow of descriptive restoration, aside from the older part of the temple of Zeus at Athens, rebuilt by Hadrian. Moreover the title of the book, "The Foundations of Classic Architecture," sufficiently vindicates the arrangement which closes with the Parthenon and the Erechtheum.

In preference to the usual list of illustrations the editor has covered that matter in his Index by page references in italic type to the illustrations, the buildings themselves being listed alphabetically under the cities and towns where they are located. Although this method appears logical when described in print, it probably subjects the reader to more trouble than is caused by looking over a list of illustrations arranged in the order of number. For instance, under "Doric Order" in the Index we find thirty-two italic numbers relating to that number of illustrations, none of which are specified as to subject matter. To this reviewer the old-fashioned method seems to be much the best. The choice of illustrations is excellent. We must not forget to mention and praise the drawings of typical subjects by Harold Broadfield Warren (Professor Warren's brother), which have been contributed by him to head the various chapters. The Introduction is faced by an excellent portrait of Professor Warren.

Professor Warren's knowledge of the origins of Greek architectural ornament leaves much to be desired. That the Ionic capital and the anthemion were originally identical forms which developed in different directions and were atrophied in other different directions, and that both the anthemion and Ionic capital are derived from an Egyptian highly conventionalized lotiform ornament, is not stated in his book, neither is it even suggested as a possibility, nor are any of the authorities mentioned who have made contributions to this subject. He is equally unaware that the Assyrian "palmetto" and the so-called Assyrian rosette are both conventional lotus motives of Egyptian origin. His extreme attainments and sole contributions to the general subject of lotiform derivations in Greek architectural ornament are the remark that "the egg and dart moulding was probably derived from certain variants of the Egyptian lotus flower and bud ornament" (p. 154), and that the "source of the anthemion or honeysuckle ornament is partly the Egyptian lotus flower and bud ornament, partly the Assyrian palmetto" (p. 155).

As a matter of fact the Assyrian palmetto is a variant of the Egyptian lotus palmette and it is from this Egyptian palmette, which is a combination of a demi-rosette and a voluted lotus trefoil, and not from an "Egyptian lotus flower" as such, that the anthemion is derived. It was not even derived from the Assyrian palmetto as an intermediate form. As to the lotiform origin of the egg and dart moulding and its variant, the leaf and dart, its lotiform origin is not only a probability but is one of the most definitely proven facts in the history of art. Not less positive is the ultimate derivation of the Ionic volutes, and therefore of the capital itself, from the trefoil lotus of Egypt. Professor Warren's suggestion that the origin of the Ionic volutes is in forms of spiral metal work appears to have been offered in ignorance of the evidence, and not in opposition to it, as he is universally disposed to weigh the pros and cons of opposing views on doubtful questions, to state both sides fairly, and to support his own opinions by deliberate and temperate argument. The absence of snap judgments and blunt statements on doubtful points is one of the greatest charms of his book, and is notably illustrated by his consideration of the alleged timber origin of the Doric triglyph.

However, it still remains a problem how so well-read a scholar can have failed to mention the evidence for the lotiform origin of the Ionic capital. Professor A. D. F. Hamlin's "History of Ornament" (1916), for instance, contains categorical statements as to the Egyptian lotiform origin of the Ionic capital, the anthemion, the Assyrian palmette and the egg and dart moulding. His earlier publications on the same subject in THE AMERICAN ARCHITECT and

in the *Architectural Record* were not less conclusive.* Professor Alfred C. Haddon's "Evolution in Art" (1902) carries thirty pages on this general subject to the same effect. Alois Riegl's *Stilfragen* or "Style Problems" (a History of Ornament, 1893), carries about one hundred pages to the same effect. Oscar Montelius' *Typologische Methode* (1903) contains thirty-four folio pages to the same effect. (Haddon and Riegl are respectively the best British and German authorities on the history of ornament, and Montelius is the most distinguished archæological authority of Sweden and of all Scandinavia.) My own publications on the subject have been abundantly quoted by these various authorities, and my first announcements preceded in time all which have been mentioned. My own first publication contains an acknowledgment as to the precedence in publication on the Egyptian and lotiform origin of the Ionic capital to the distinguished Persian explorer, Marcel Dieulafoy, and the French antiquarian, Georges Colonna-Ceccaldi.†

This review is disposed not so much to criticize the work of Professor Warren on the given subject as it is to raise a warning voice against a rather general neglect of the evidence for the Egyptian and lotiform origin of the Ionic capital. In view of the great prominence which has been given by authorities on art history and archæology to the subject of the Ionic capital, the crushing and conclusive evidence, which has now been extant for nearly thirty years on the subject of its true origin and history, ought to be widely and universally known.

Professor Warren's Egyptian chapter is also in error in its description of the lotus of the Egyptian monuments, of which it is said (p. 38) that: "Its leaves do not float on the water but grow above it and are somewhat bell-shaped rather than flat. The seed pod also is of bell shape." This description fits the nelumbium or rose lotus, but this never occurs in Egyptian ornament.‡ The leaves of the Egyptian nymphæs (blue and white) are cleft and float on the water like those of the common pond lily, and the bell-shaped seed-pod is confined to the nelumbium. (The picture in Webster's Dictionary erroneously represents cleft leaves rising above the water.) This matter appears to be of no importance until we consider the difference in the forms of the sepals. The sepals of the nymphæs are only four in number and rise to the height of the petals. Egyptian art always represents three sepals in profile view, and from these, by conventional abbreviation and elimination of the less conspicuous petals, the lotus trefoil of all later art was developed. The sepals of the nelumbium are numerous but short and inconspicuous and they disappear from view and also drop off when the flower expands. The Egyptian trefoil could never have developed from pictures of the nelumbium, and if Egyptian pattern ornament had pictured the nelumbium it could not have developed the voluted trefoil (original Ionic form) or the lotus trefoil in general, or the pattern which ultimately produced the egg and dart moulding.

The Egyptian chapter contains the statement (p. 55) that "the scheme of the normal temple plan is symmetrical . . . all the main doorways connecting the courts and halls are carefully placed on the axis of entrance." On the contrary the plans of various Egyptian temples are out of axis, and so much so that the distinguished British astronomer, J. Norman Lockyer, has advanced the theory that the twists in plan of certain temples are connected with a system of orientation toward certain stars, whose positions changed gradually during the period of temple construction.* We need not look farther than Baedeker's plan of the temple of Luxor to find a remarkable instance of twisted axes and of asymmetrical ground plans in the various courts and halls. The occurrence of asymmetries of plan in Egyptian temples has been so generally remarked that the term "symmetrophobia" has been coined to characterize this peculiarity.†

Without in the least taking ground as to Professor Lockyer's theory the reviewer simply quotes it as showing how twisted the Egyptian plans frequently are, and especially because the analogy with the deflected plans and twisted axes of many medieval cathedrals is obvious and interesting. The latter are certainly not to be explained on astronomical grounds.

"The History of Architecture," by Russell Sturgis (1906) offers a brilliant exception to the constant and regrettable oversight by other authors on Egyptian architecture, including Professor War-

**American Architect and Building News:* The Evolution of Decorative Motives, Vol. 59, pp. 35-36; Vol. 60, pp. 43-45, 67-68; Vol. 61, pp. 11-13; Vol. 62, pp. 87-88 (1895); Vol. 68, pp. 11-12 (1900). *The Architectural Record*, A Study of Evolution, Persistence and Reversion in Ornament Motives. Trefoil and Palmette. Vol 8, No. 1 (1898).

† The Egyptian origin of the Ionic capital and anthemion, *American Journal of Archeology*, Vol. III, No. 4, 1888; six papers on "The Lotus in Ancient Art", AMERICAN ARCHITECT for 1889, pp. 67, 115, 178, 201, 225, 309; *The Grammar of the Lotus*, Royal Quarto, 408 pp. and over 1100 illustrations. Sampson Low, London, 1891. Five articles in the *Architectural Record* for 1892-3-4; Vol. II, No. 2, No. 4; Vol. III, No. 2, No. 3; Vol. IV, No. 1.

‡ See Wilkinson, *Ancient Egyptians*, III, p. 133, 3rd edition. The evidence is complete in the *Grammar of the Lotus*. See chapter on "Lotus Forms Mistaken for Nelumbiums", pp. 25-40. The error also occurs in Perrot and Chipiez, and has been general. My own quoted publications which preceded the Lotus Grammar are also in error on this point.

* See J. Norman Lockyer, "The Dawn of Astronomy, A Study of the Temple-Worship and Mythology of the Ancient Egyptians (1894); pp. 162-3 and others.

† For the use of this word see, for instance, J. Norman Lockyer, The Early Temple and Pyramid Builders, *Nature*, May 18, 1893; reprinted in *Smithsonian Reports*, July, 1893, p. 95.

ren, of the discovery and survey by Pennethorne, in 1832-33, of curves in plan, convex to the court, in the second temple court at Medinet, Habou.* With the exception of Auguste Choisy (*Histoire de l'Architecture,* 1899), and my own publications, this most important matter has otherwise been generally ignored. It not only has obvious and serious bearings on the problems offered by the Greek refinements, but also bears on recent observations of similar curves in plan in many mediæval cloisters.

Under the chapter for Mesopotamia it may be noted that various authorities are disposed to hold that the dome (as well as the vault) was known to ancient Assyria, whereas Professor Warren holds (p. 91) that "there is no evidence of any such use." We need not go farther than Sturgis to find a contrary opinion.†

The chapter for Persia does not remark the notable and decisive appearances of Egyptian architectural forms in the buildings of Persepolis. This evidence is to be found especially in photographs which were unknown to the earlier European authorities, and later writers have usually followed the beaten track in this particular, as the actual visitors to Persian sites have been few and far between. Hamlin is, however, a notable exception to the habitual oversight and also verifies the fact by illustration.‡

Our review now reaches some incidental particulars of the chapter on Greece. Aside from the matter on the origins of Greek ornament, already criticized, the general verdict of this reviewer is unstinted praise, but some oversights may still be mentioned. Naucratis was not founded on the site of Alexandria, as stated at p. 261. It was at Nebireh, about 50 miles to the southwest.

In speaking of the Doric temples of the archaic period it is stated (p. 202) that "the intercolumniation of the side is often much narrower than that of the front." This is true, but the converse fact ought also to be mentioned that the intercolumniation of the fronts is often systematically narrower than that of the flanks. This holds of the Basilica at Paestum, which has an average increase on the sides of 9 inches for each spacing, and the following temples have similar arrangements—Temple D at Selinus, with an increase of 5½ inches; and Temple F at Selinus, with an average increase of 5 inches. The sixth century Greek temple at Pompeii, and the sixth century Greek temple near Metaponto (The Tavole Paladine) show minimized phases of the same peculiarity. The Poseidon temple at Paestum also has systematically wider spacings on the sides, with an increase over the fronts of one inch.* According to this showing there does not appear to have been any preference for the system of making the front intercolumniations wider than those on the sides, as only about seven instances can be quoted for this method to which Professor Warren's mention is confined. To realize that both methods were used indifferently is important, as it would then appear that there was no special cause for the front widening as opposed to that of the flanks. The reason for both systems would then appear to have been a preference for the optical interest created by inconspicuous asymmetry. In this connection it ought to be remembered that the cause for abandoning this kind of asymmetry was the introduction of another kind, viz., the spatial intercolumnar diminutions at the temple angles involved in the problem of the angle triglyphs.†

In the description of the sixth century Temple C at Selinus it is stated that "the spacings of the columns are slightly irregular, as are the diameters." As a matter of fact the maximum variation of intercolumniation on the north side of Temple C is 8 inches, and the maximum variation of columnar diameters is 8½ inches.‡ This is much more than a "slight irregularity," and it is the greatest unsystematic variation of corresponding spaces known in archaic Greek art. The maximum irregular discrepancy of spacings in the Hera temple at Olympia is 5½ inches. Professor Warren has correctly quoted in figures the average increase of the front intercolumniations (of Temple C) as compared with the sides, as being about 22 inches. His statement that the columns in the Basilica at Paestum "are evenly spaced" (p. 215) appears to overlook the nine-inch increment of intercolumniation for each space on the flanks, but is true of the columns of any one side taken together, outside the limits of a mason's error not exceeding 2½ inches.

These minor corrections may be considered worth while because Koldewey and Puchstein are our sole reliable authority for measured surveys of the Italian and Sicilian temples. Their results were not published until 1899, and unless translated must remain unknown to students who do not read German. In so far as inaccuracies are committed or suggested in the use of their results it is best to point it out. It is one of Professor Warren's great merits that he has made a generous use of this unique authority, and a reliable one with the rare exceptions noted.

In the preliminary account of the Doric order

*See Sturgis, pp. 39, 40 with plan. See also Pennethorne, *Geometry and Optics of the Ancients* p.81 (1878), and Goodyear, *Greek Refinements,* pp. 23, 24, 34-41 (1912).

† *History of Architecture,* Vol. 1, p. 64, with an illustration.

‡ *History of Ornament,* p. 67 (1916).

*See Goodyear, *Greek Refinements,* pp. 177, 178, 188 for references to Koldewey and Puchstein.

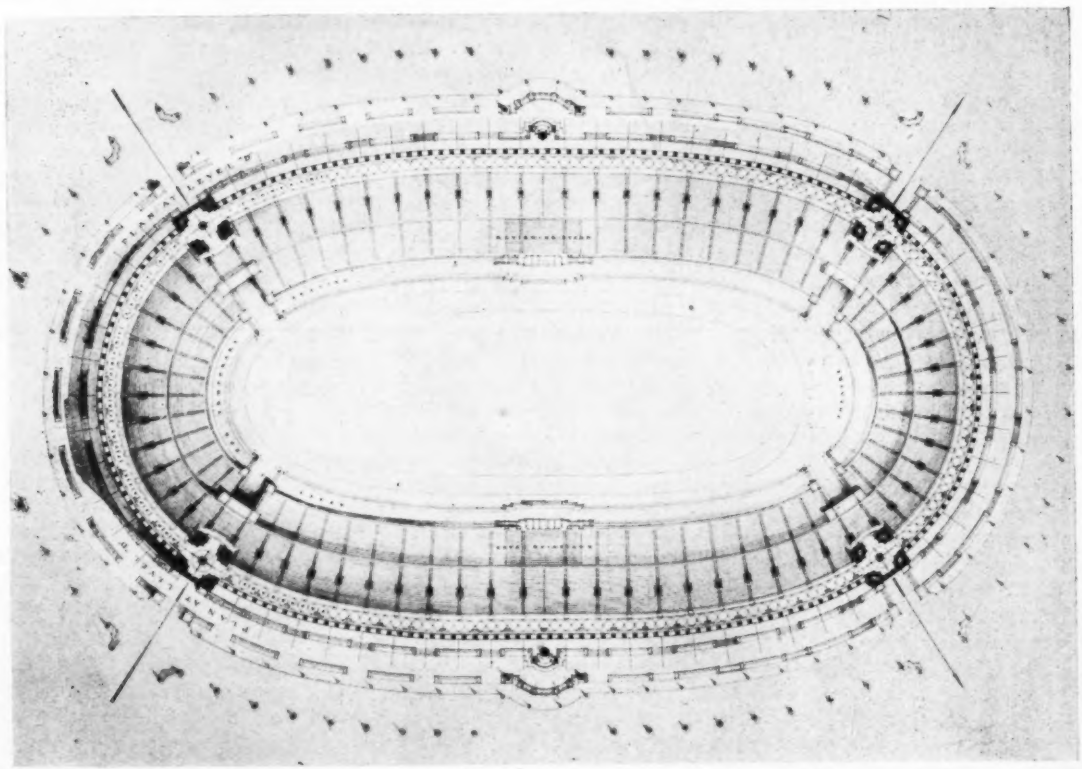
† See Goodyear, *Greek Refinements,* pp. 186-187.

‡ See Goodyear, *Greek Refinements,* pp. 175, 176, for references to Koldewey and Puchstein.

it is stated, as regards the correspondence of triglyphs and columns, that "all the other columns (aside from the angle columns) are so placed that the center of each column is vertically on a line with the center of a triglyph, usually of each alternate triglyph." This statement is corrected by implication in the text supplied by Professor Kimball relating to the Parthenon, where it is stated (p. 329) that: "Although the triglyphs do not come quite on axis with the columns, they are delicately adjusted, so that no awkwardness is felt." It is usual, as is done here, to attribute these delicate dislocations to the problem of the angle triglyph and the related intercolumnar spatial diminutions at the temple angles.

Commendable attention is given throughout the chapter on Greece to the subject of the columnar entasis, which is more frequently lacking in Greek temples than may be generally realized. Each instance of the absence or presence of the entasis is specified. Instances of horizontal curvature are also frequently menticned, but the curves in plan in the Poseidon temple at Paestum (convex to exterior on the entablature of the flanks and concave to exterior in the entablature under the gables) are not specified, although the horizontal curves in elevation of the same building are mentioned. There is also no mention of the horizontal curves in elevation of the temples of Concord and Juno Lacinia at Girgenti. In justice to Professor Warren it ought to be added that Koldewey and Puchstein have also ignored the curves in plan at Paestum and the curves in elevation at Girgenti, the observation of which is mentioned in my *Greek Refinements* (1912). Jacob Burckhardt quoted the convex curves in plan at Paestum as long ago as 1855. They are also mentioned by Marquand's Greek Architecture (1909).

The general subject of the greek refinements is ably treated by Professor Kimball in his matter for the Parthenon, where they have been most completely surveyed. It is gratifying to notice that Professor Kimball has ignored the popular but incorrect opinion that there is an optical effect of sagging in a long horizontal line, and that the Greek horizontal curves in elevation were intended to correct this optical illusion.



PLAN
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Public Opinion and City Planning Progress

By JOHN NOLEN, *City Planner*

TO stimulate interest and make clear the need of city planning is an important part of the task of establishing new ideals and new standards. It is a publicity job, this work of making intelligible to the public generally what city planning really means. We must aim to get all who are interested in their community to see the planning of a city in its simple, practicable and financially advantageous outlines.

The making of public opinion for city planning is like making public opinion for pretty much anything else. It is done through the newspapers, by public exhibitions of plans, by moving pictures, if they can be made available, by the printing of reports, pamphlets and popular leaflets, by public meetings, illustrated lectures, the use of the stereomotorgraph and attractoscope, and free and wide discussion. One important thing to discuss is the financial results of city plans—that in a big sense, city planning pays. That might be the first appeal. The second appeal is almost opposite. It is the appeal to sentiment, to idealism, to loyalty to one's own community. It is surprising how quickly business organizations, such as chambers of commerce and boards of trade, respond on the ground that city planning promotes the city's welfare. The third appeal is to the imagination. It is the need of actual plans. It is necessary to visualize as graphically and attractively as possible various proposals for improvement, especially as related in comprehensive schemes. The final appeal is that of an object lesson, something actually done, even though it is but a small part of the general plan. This involves the execution of a park, a playground, a garden suburb, a viaduct, a better type of bridge, a union station, a civic center—some feature, but with reference to the whole plan. Such an object lesson will often convince the most skeptical, even those whom the other appeals do not reach.

It is sometimes said that city planning schemes are not carried out. To some extent this statement is true. The execution of comprehensive city plans requires time, often a generation; also money, large sums; also authority, sometimes a change in the state laws or even in the state constitution; also the formation of favorable public opinion. Horace Bushnell, in his agitation for the first city public park in the United States, said, "Many things must be carefully prepared, as carefully watched, and persistently pushed, by the man who will get any city public into and through a great public improvement. Wearied, and worried, and hindered, he must never sleep, never be beaten, never desist, and if, by a whole five years of toil, he gets his work on far enough to become an interest in itself, and takes care of itself, he does well, and there may rest."

The answers received from a questionnaire sent out recently to more than a score of cities, uniformly emphasizes the same conclusions with regard to the success or failure of city planning proposals. Careful examination of the responses shows that the degree of success is dependent on a regard for and adherence to certain principles. The solution of the whole problem seems to lie in diplomatic, carefully planned, and if need be, a long extended campaign of education aimed to reach not only the well informed and prominent elements of the community, but also the laboring classes and the public at large. In other words, the success of the commissions, from replies which were received, may be graded by the progress of such campaigns of education in their towns and cities.

To one who is familiar with the natural and formidable obstacles to the execution of comprehensive city planning projects and the progress that has been made already, the astonishing thing is that so much has been done, especially in the smaller places. In some cases, as for example, Glen Ridge, N. J., and Walpole, Mass., virtually all the proposals have been carried out, or are definitely authorized for execution. In other cases even though the city plan commissions were not able at the time to get the approval of their recommendations, the plans have been partially executed by the city council or other public authority. The words of Daniel H. Burnham have often proved true: "A logical diagram, once recorded, will never die, but long after we are gone will be a living thing, asserting itself with ever-growing insistency." Furthermore, the city planning movement, it should be recalled, is still in its initial stages. Its merits are not yet clearly understood by the general public, and very little money is available for the making of careful plans, based upon reliable surveys, and the publicity necessary "to sell" those plans to the people for whom they were prepared.

With the possible exception of Chicago, no town

or city in the United States has yet taken city planning seriously. Chicago's methods have been more logical, more persistent and more systematic than those of any other city. The whole story is convincingly presented in Walter D. Moody's recently issued book entitled "What of the City?" published by A. C. McClurg & Company, with the sub-title "America's Greatest Issue—City Planning, What It Is, and How to Go About It to Achieve Success." Some of the main facts to record in the program to "put across" Chicago's City Plan are the following:

1. The printing of the report on "The Plan of Chicago" at a cost of $85,000. This was in the form of a beautiful octavo volume, the very finest example of printers' craftsmanship. It contained 164 pages and 134 drawings, charts and pictures, including 15 full-page, six-color drawings painted by the famous artist, Jules Guerin.

2. The publication of a booklet entitled "Chicago's Greatest Issue—An Official Plan." The basis of this publication was the de luxe Chicago Plan book, issued by the Commercial Club. Many of the drawings of the parent book were adapted to the smaller one. Its 93 pages, carrying the 328 names of the members of the commission, representing every walk of life in the city, told the story of the Plan of Chicago to all the people in simple, easily comprehended, everyday language. Copies numbering 165,000 were issued and distributed at a cost of $18,000. These were delivered to every property owner of the city and to persons paying a rental of $25 per month and over. "Chicago's Greatest Issue" was sent, on request, all over the civilized world.

3. A notable pamphlet was printed and issued, entitled "Fifty Million Dollars for Nothing." It showed the people of Chicago how they could obtain 1300 acres of lake front parks, playgrounds and watercourses by utilizing the waste material of the city. It pointed out that by so doing the city could secure in twelve years park lands ready for development and worth fifty million dollars at no cost whatever to the taxpayers.

4. There were many other special pamphlets and reports, but to cap all, the Commission issued a publication entitled "Chicago's World-wide Influence in City Planning." It was an effort to "keep the home fires burning" with community confidence and devotion to its own plan as it was regarded by the rest of the world. This was a compilation of comments and requests for Chicago Plan literature from hundreds of experts, civic workers, municipal authorities, libraries, schools and public-spirited citizens, received by the Commission from all over the world.

5. Following the signing of the armistice in the great war and the announcement of the reconstruction platform of the Chicago Plan Commission, to which the Chicago newspapers devoted twelve columns, an appeal was made to the clergy of the city to preach from their pulpits upon the humanitarian benefits of the Plan of Chicago. The Commission's "Seed Thoughts for Sermons" pointed out the close harmony between the social workers in the churches and the benefits in the plan. This document, together with a resolution and the reconstruction platform, was sent to every clergyman in Chicago.

6. As a direct result of the admonition "Establish the Plan of Chicago with the People." a school text book was printed, entitled "Wacker's Manual of the Plan of Chicago." This came as an inspiration. The Plan of Chicago text book was adopted by the Chicago Board of Education in 1912. The first issue was 15,000 copies. It was used as a part of the curriculum of the eighth grade course. The school authorities followed the wish of the plan executive, whose conviction it was that a larger number of students could thus be reached. It was believed, too, that there was value in an appeal to the children at their most impressionable age. More than 50,000 copies of Wacker's Manual have been published for the current needs of the school.

7. After the school book came the lecture bureau. A popular lecture, showing more than 200 pictures of twenty-four countries of the world, was most carefully prepared, and critics say it compares favorably with the popular lectures of the day delivered by professional speakers. The Board of Education placed the assembly halls of the schools at the disposal of the plan officials without price. How to attract the people to the Plan of Chicago lectures was the task. The difficulties, however, were finally overcome. As many as 150,000 circular announcements of the lectures were mailed to citizens in a single season. Nearly a hundred school lectures were delivered in one year. The schools were selected in order and equitably covered the city. This method was continued from year to year, and during the first seven years of the Commission nearly four hundred lectures were delivered. One hundred and seventy-five thousand people have been directly reached with the plan message; that is, one in every fourteen residents of Chicago.

8. One of the chief aids to the effective publicity for the Plan of Chicago was a motion-picture campaign. This consisted of a two-reel feature entitled "A Tale of One City." It contrasted the plan proposals with existing conditions, and was interspersed with scenes of human interest and attraction

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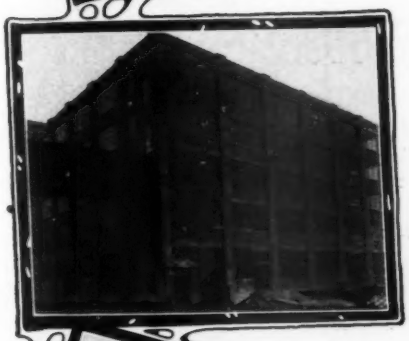

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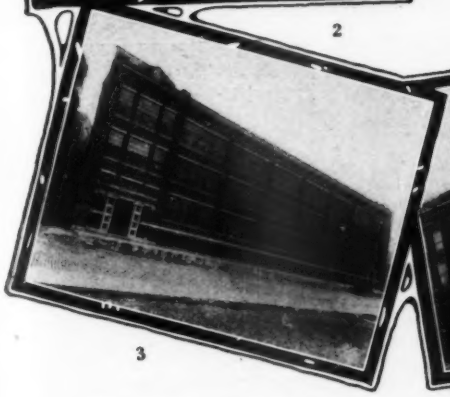

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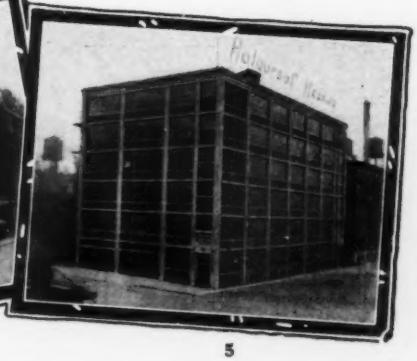

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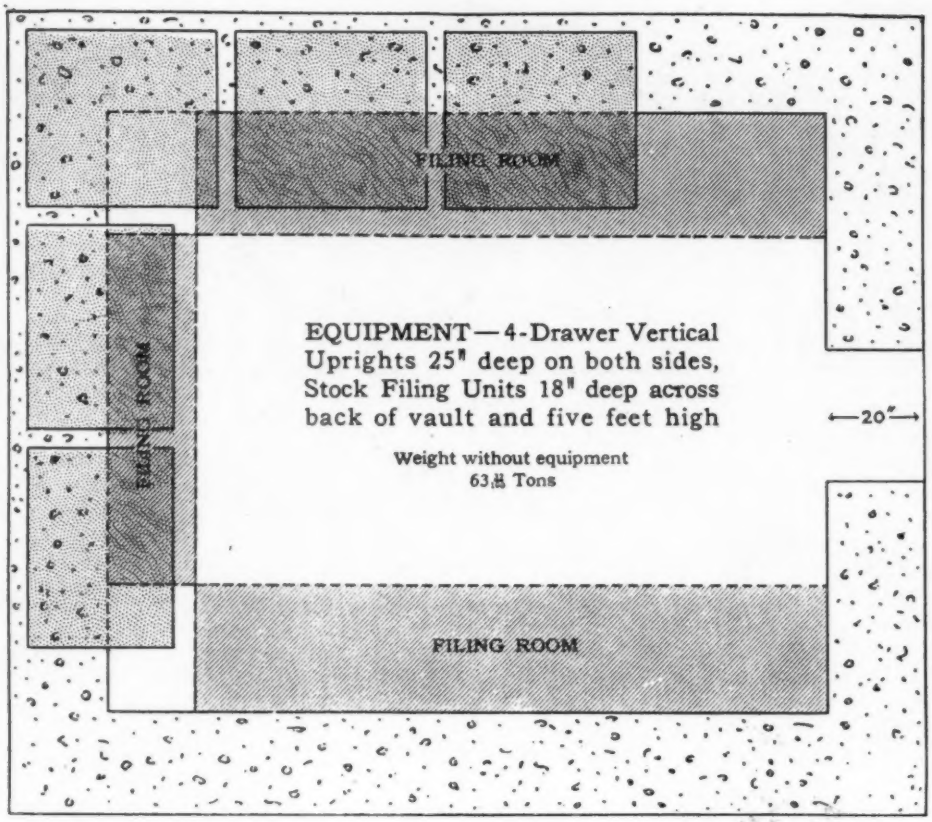
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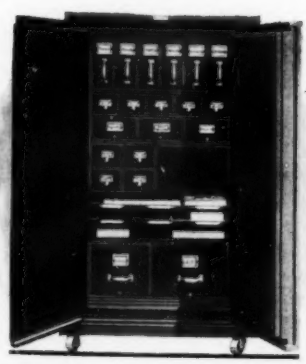

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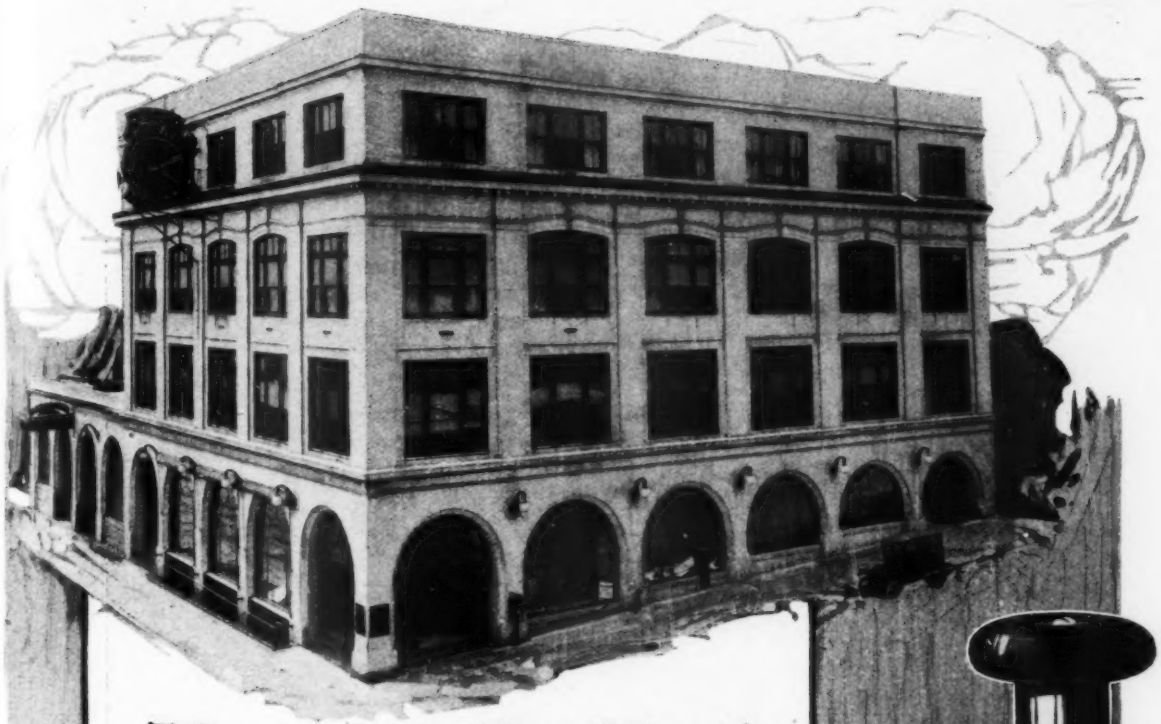

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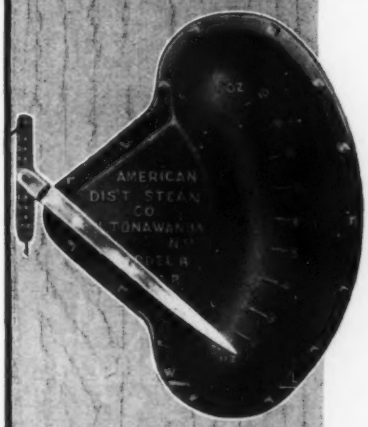

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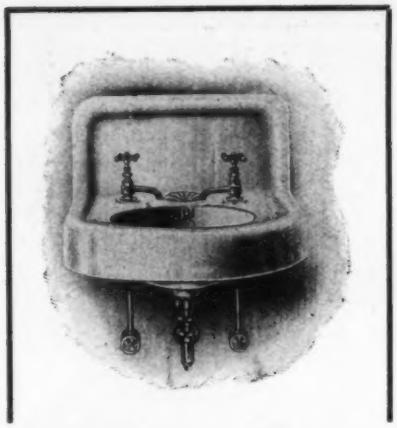

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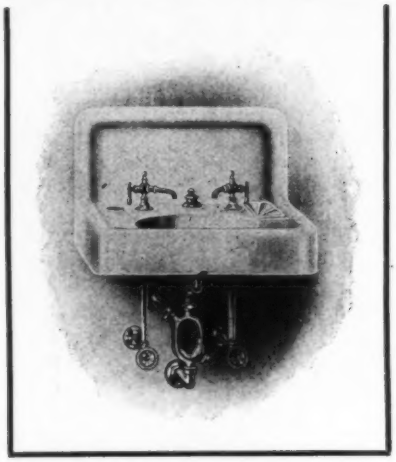

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THE AMERICAN ARCHITECT

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The Foundations of Classic Architecture*

BY WM. H. GOODYEAR, M. A., CURATOR OF THE DEPARTMENT OF FINE ARTS
HON. MEMBER SOCIETY OF ARCHITECTS OF ROME; HON. MEMBER OF EDINBURGH ARCHITECTURAL ASSOCIATION; HON. MEMBER ROYAL ACADEMY OF FINE ARTS OF MILAN; HON. ACADEMICIAN ROYAL ACADEMY OF VENICE; CORRESPONDING MEMBER AMERICAN INSTITUTE OF ARCHITECTS

PROFESSOR HERBERT LANGFORD WARREN (1857-1917) had been, at the time of his death, for many years Dean of the Faculty of Architecture of Harvard University. His book on The Foundations of Classic Architecture is a posthumous work, edited by Fiske Kimball, Professor of Art and Architecture in the University of Virginia, who has supplied an introduction, and selected most of the illustrations, but has otherwise published the text substantially as left in manuscript by Professor Warren, with the exception of the concluding twenty-eight pages relating to the Parthenon and the Erechtheum, which were lacking to the otherwise finished manuscript. It appears from Professor Kimball's Introduction that Professor Warren had planned for many years a work on the general history of architecture, of which this was to be a portion, but it also appears, both from the Introduction and from an examination of the book itself, that it is a complete unit for the subject of Greek Architecture, and the preceding architecture of Egypt and Mesopotamia. Hence the choice of the title, The Foundations of Classic Architecture, which appears quite properly to cover the subject matter of the book.

Professor Kimball's Introduction includes an interesting biography of Professor Warren, from which we learn that he was born in Manchester, England, although of New England Colonial ancestry on the father's side; that his school days were passed in Manchester, aside from two years (1869-71) in the gymnasia of Gotha and Dresden; that from 1871-1875 he studied at Owen's College, Manchester, and after entering the office of a Manchester architect, came to this country in 1876. After studying architecture from 1877-1879 under Professor William R. Ware at the Massachusetts Institute of Technology, he entered the office of H. H. Richardson, and remained there from 1879-1884. In this office he was in close relations with its distinguished head, and when he left his employ in 1884 it was to travel in England, Italy and France. In 1885 he began independent practice in Boston, and also had an office in Troy, N. Y. In 1886 and 1887 he was attached to the editorial staff of "The Sanitary Engineer," but continued to practice architecture as a member of the firm of Warren, Smith and Biscoe; subsequently the firm of Warren and Smith, which continued until his death. Although in later years he maintained a connection with the practice of his profession, he was able to give but little time to its actual pursuit, on account of the demands on his time as an administrative officer in Harvard University, and as a distinguished teacher there of his art. In 1893-94 he served as instructor; from 1894-1899 as assistant professor; from 1899-1903 as professor, and from 1903 to his death as Nelson Robinson, Jr., Professor of Architecture. He also lectured on architectural history at the Massachusetts Institute of Technology. At the time of his death he had completed nearly twenty-five years of faithful service to the University.

Thus, among the well known features of Professor Warren's career are his distinction as Dean of the Architectural School of Harvard University, his notable attainments and eminent connections as a professional architect, and his long experience and high reputation as an educational lecturer on the History of Architecture. To these points we may add the serious importance of his various contributions to the literature of the subject in the way of magazine and dictionary articles (which are mentioned in the Introduction of the present work).

All these things would lead to the conclusion that any book which Professor Warren had carefully planned and carefully written would be of great interest and importance. On the other hand let it be remembered that the ground covered by this book has been traversed again and again by the

* The Foundations of Classic Architecture, by Herbert Langford Warren, A.M., Late Fellow of the American Institute of Architects, and Dean of the Faculty of Architecture of Harvard University. Illustrated from Documents and Original Drawings. The Macmillan Company, Publishers, New York, MCMXIX. 8vo. Pages XIV-357. 126 illustrations. Price, $6.00.

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most distinguished architectural historians of the nineteenth and twentieth centuries. Several of these historians are American and English authors whose books are comparatively recent, whose abilities in the matter of literary style and expression have been excellent, whose knowledge of the literature of the subject left nothing to be desired, and whose acquaintance with the original monuments had been intimate and thorough.

Thus, a new book which travels over such familiar ground as the history of architecture in Egypt, Mesopotamia and Greece must be judged not only on its own merits, but also in relation to the merits of its very excellent and numerous predecessors, some of them of quite recent date. The present reviewer was consequently somewhat startled by his own favorable first impressions of Professor Warren's book, which appeared to him to be not only the last, but also the best, of its kind. These impressions have been confirmed by a reconsultation of the most notable preceding works of its class.

Although it is naturally impossible to say anything absolutely new about Egyptian art as a reflex of Egyptian environment, character and history, when we consider what French and German authorities have contributed to this subject, it is the present reviewer's opinion that there is not in the English language an equally readable, sympathetic, thorough, well-digested and artistically projected summary of the subject. Its treatment rises to the rank of inspiration. In the first chapter of his book, which is devoted to Egypt (70 pages), Professor Warren thus establishes his claim to be considered not only as an excellent architectural authority, but also as an eloquent and sympathetic student of the philosophy of history.

What has just been said of the Egyptian chapter is equally true of those which follow—Mesopotamia (in 28 pages); Persia (in 15 pages); the Aegean, i.e., the Cretan and Mycenaean period (in 27 pages); and Greece (156 pages).

In these later chapters, as in the first, Professor Warren's thought and the language used to express it leave nothing to be desired. The style is worthy of the subject. The arrangement of the matter is logical and equally praiseworthy for its selection of the important monuments and for its omission of the less important. It is a constant experience that the multiplication of facts in books tends to confuse and overload the memory. The great merit of this book is that it will not overtax the mind of the reader who is new to the subject.

This result is obtained by restricted and careful selection in the choice of subject matter, combined with a readable, flowing, eloquent and agreeable style of presentation. In compendious books we must generally contend with a density of style which makes them hard reading—a density which is due to the effort to cover much ground in a limited space. Professor Warren's happy faculty of grasping and projecting his subject as a whole has enabled him to achieve by wise omissions which are not at all prejudicial to his book, but on the contrary rather assist it, the results usually obtained through condensation. Space is thus available for picturesque descriptions, incidental local color and glimpses of the historic or local background. Above all space is available, and is taken, for the statement of both sides of the case when debatable points are in question, for the balancing of evidence, and for the presentation of the independent views and personal arguments of the writer, which almost invariably commend themselves as sane and reasonable. For instance, there is no other equally careful and convincing treatment in the literature of the subject, of the question as to the origin of the Doric style in timber construction. In other cases, as in the downward dating to the late sixth century of the Temple of Corinth, which used to be regarded as the oldest Greek temple ruin, the author shows himself to be an independent and original authority.

As to the special subject of Greek architecture the reviewer holds that there is no book in the English language which contains an equally careful, circumstantial, explicit and sympathetic account of the details of the Doric Order, and this is especially true of the Doric shaft. Following the introductory account of the Greek Doric Order and its details, the method followed by Professor Warren is especially successful because it consists of a series of local descriptions with appropriate illustration and restorations, of each important temple ruin, in its present condition and present surroundings; these descriptions being arranged according to the order of date. Thus is achieved an orderly sequent history of the subject, which is relieved and brightened by local color, and also by interesting details of local history. As a result of this arrangement, and because many of the Sicilian temples belong to the earlier or earliest dates, they are given an amount of emphasis and space which does not always fall to their lot, and which they undoubtedly deserve. At this point and in this particular it is proper to emphasize a feature which makes Professor Warren's book an indispensable part of every architectural library, viz., the circumstantial details derived from the recent Sicilian and Italian surveys of Koldewey and Puchstein.* Up to 1899 our only authority for Sicily was practically Hittorff and Zanth, *Architecture Antique de la Sicile*,

*Die Griechischen Temple in Unteritalien und Sicilien (1899).

dating in the first edition as far back as 1827, and dating in the second edition to 1870.

According to the method followed by Professor Warren the sequent history of the Doric style closes with the Temple of Zeus at Olympia, completed about 456 B. C. The next matter is a description of the Ionic Order and its origins, which is immediately followed by an account of the Athenian monuments, both Doric and Ionic (omitting the Ionic temples of Asia Minor which are known only by literary record). This account closes the book.

It does not appear to the reviewer that any other book on the subject of Greek architecture has achieved the artistic climax of leading up to, and closing with the Parthenon, which Professor Warren has obtained by thus following the order of time in which the surviving Greek temples were built, and combining with this arrangement an account of their local surroundings and their local history. What could offer a better climax than an account of the Parthenon and the Erectheum? Professor Kimball deserves great credit for his completion of the text for these buildings. It is a worthy counterpart in style, thought and method of the rest of the book. Although the temples of the Corinthian Order which belonged to the Alexandrian period were also Greek, as a matter of course, it so happens that none of their ruins have been sufficiently preserved to allow of descriptive restoration, aside from the older part of the temple of Zeus at Athens, rebuilt by Hadrian. Moreover the title of the book, "The Foundations of Classic Architecture," sufficiently vindicates the arrangement which closes with the Parthenon and the Erechtheum.

In preference to the usual list of illustrations the editor has covered that matter in his Index by page references in italic type to the illustrations, the buildings themselves being listed alphabetically under the cities and towns where they are located. Although this method appears logical when described in print, it probably subjects the reader to more trouble than is caused by looking over a list of illustrations arranged in the order of number. For instance, under "Doric Order" in the Index we find thirty-two italic numbers relating to that number of illustrations, none of which are specified as to subject matter. To this reviewer the old-fashioned method seems to be much the best. The choice of illustrations is excellent. We must not forget to mention and praise the drawings of typical subjects by Harold Broadfield Warren (Professor Warren's brother), which have been contributed by him to head the various chapters. The Introduction is faced by an excellent portrait of Professor Warren.

Professor Warren's knowledge of the origins of Greek architectural ornament leaves much to be desired. That the Ionic capital and the anthemion were originally identical forms which developed in different directions and were atrophied in other different directions, and that both the anthemion and Ionic capital are derived from an Egyptian highly conventionalized lotiform ornament, is not stated in his book, neither is it even suggested as a possibility, nor are any of the authorities mentioned who have made contributions to this subject. He is equally unaware that the Assyrian "palmetto" and the so-called Assyrian rosette are both conventional lotus motives of Egyptian origin. His extreme attainments and sole contributions to the general subject of lotiform derivations in Greek architectural ornament are the remark that "the egg and dart moulding was probably derived from certain variants of the Egyptian lotus flower and bud ornament" (p. 154), and that the "source of the anthemion or honeysuckle ornament is partly the Egyptian lotus flower and bud ornament, partly the Assyrian palmetto" (p. 155).

As a matter of fact the Assyrian palmetto is a variant of the Egyptian lotus palmette and it is from this Egyptian palmette, which is a combination of a demi-rosette and a voluted lotus trefoil, and not from an "Egyptian lotus flower" as such, that the anthemion is derived. It was not even derived from the Assyrian palmetto as an intermediate form. As to the lotiform origin of the egg and dart moulding and its variant, the leaf and dart, its lotiform origin is not only a probability but is one of the most definitely proven facts in the history of art. Not less positive is the ultimate derivation of the Ionic volutes, and therefore of the capital itself, from the trefoil lotus of Egypt. Professor Warren's suggestion that the origin of the Ionic volutes is in forms of spiral metal work appears to have been offered in ignorance of the evidence, and not in opposition to it, as he is universally disposed to weigh the pros and cons of opposing views on doubtful questions, to state both sides fairly, and to support his own opinions by deliberate and temperate argument. The absence of snap judgments and blunt statements on doubtful points is one of the greatest charms of his book, and is notably illustrated by his consideration of the alleged timber origin of the Doric triglyph.

However, it still remains a problem how so well-read a scholar can have failed to mention the evidence for the lotiform origin of the Ionic capital. Professor A. D. F. Hamlin's "History of Ornament" (1916), for instance, contains categorical statements as to the Egyptian lotiform origin of the Ionic capital, the anthemion, the Assyrian palmette and the egg and dart moulding. His earlier publications on the same subject in THE AMERICAN ARCHITECT and

in the *Architectural Record* were not less conclusive.* Professor Alfred C. Haddon's "Evolution in Art" (1902) carries thirty pages on this general subject to the same effect. Alois Riegl's *Stilfragen* or "Style Problems" (a History of Ornament, 1893), carries about one hundred pages to the same effect. Oscar Montelius' *Typologische Methode* (1903) contains thirty-four folio pages to the same effect. (Haddon and Riegl are respectively the best British and German authorities on the history of ornament, and Montelius is the most distinguished archæological authority of Sweden and of all Scandinavia.) My own publications on the subject have been abundantly quoted by these various authorities, and my first announcements preceded in time all which have been mentioned. My own first publication contains an acknowledgment as to the precedence in publication on the Egyptian and lotiform origin of the Ionic capital to the distinguished Persian explorer, Marcel Dieulafoy, and the French antiquarian, Georges Colonna-Ceccaldi.†

This review is disposed not so much to criticize the work of Professor Warren on the given subject as it is to raise a warning voice against a rather general neglect of the evidence for the Egyptian and lotiform origin of the Ionic capital. In view of the great prominence which has been given by authorities on art history and archæology to the subject of the Ionic capital, the crushing and conclusive evidence, which has now been extant for nearly thirty years on the subject of its true origin and history, ought to be widely and universally known.

Professor Warren's Egyptian chapter is also in error in its description of the lotus of the Egyptian monuments, of which it is said (p. 38) that: "Its leaves do not float on the water but grow above it and are somewhat bell-shaped rather than flat. The seed pod also is of bell shape." This description fits the nelumbium or rose lotus, but this never occurs in Egyptian ornament.‡ The leaves of the Egyptian nymphæs (blue and white) are cleft and float on the water like those of the common pond lily, and the bell-shaped seed-pod is confined to the nelumbium. (The picture in Webster's Dictionary erroneously represents cleft leaves rising above the water.) This matter appears to be of no importance until we consider the difference in the forms of the sepals. The sepals of the nymphæs are only four in number and rise to the height of the petals. Egyptian art always represents three sepals in profile view, and from these, by conventional abbreviation and elimination of the less conspicuous petals, the lotus trefoil of all later art was developed. The sepals of the nelumbium are numerous but short and inconspicuous and they disappear from view and also drop off when the flower expands. The Egyptian trefoil could never have developed from pictures of the nelumbium, and if Egyptian pattern ornament had pictured the nelumbium it could not have developed the voluted trefoil (original Ionic form) or the lotus trefoil in general, or the pattern which ultimately produced the egg and dart moulding.

The Egyptian chapter contains the statement (p. 55) that "the scheme of the normal temple plan is symmetrical . . . all the main doorways connecting the courts and halls are carefully placed on the axis of entrance." On the contrary the plans of various Egyptian temples are out of axis, and so much so that the distinguished British astronomer, J. Norman Lockyer, has advanced the theory that the twists in plan of certain temples are connected with a system of orientation toward certain stars, whose positions changed gradually during the period of temple construction.* We need not look farther than Baedeker's plan of the temple of Luxor to find a remarkable instance of twisted axes and of asymmetrical ground plans in the various courts and halls. The occurrence of asymmetries of plan in Egyptian temples has been so generally remarked that the term "symmetrophobia" has been coined to characterize this peculiarity.†

Without in the least taking ground as to Professor Lockyer's theory the reviewer simply quotes it as showing how twisted the Egyptian plans frequently are, and especially because the analogy with the deflected plans and twisted axes of many medieval cathedrals is obvious and interesting. The latter are certainly not to be explained on astronomical grounds.

"The History of Architecture," by Russell Sturgis (1906) offers a brilliant exception to the constant and regrettable oversight by other authors on Egyptian architecture, including Professor War-

**American Architect and Building News:* The Evolution of Decorative Motives, Vol. 59, pp. 35-36; Vol. 60, pp. 43-45, 67-68; Vol. 61, pp. 11-13; Vol. 62, pp. 87-88 (1895); Vol. 68, pp. 11-12 (1900). *The Architectural Record*, A Study of Evolution, Persistence and Reversion in Ornament Motives. Trefoil and Palmette. Vol 8. No. 1 (1898).

† The Egyptian origin of the Ionic capital and anthemion, *American Journal of Archeology*, Vol. III, No. 4, 1888; six papers on "The Lotus in Ancient Art", AMERICAN ARCHITECT for 1889, pp. 67, 115, 178, 201, 225, 309; *The Grammar of the Lotus*, Royal Quarto, 408 pp. and over 1100 illustrations. Sampson Low, London, 1891. Five articles in the *Architectural Record* for 1892-3-4; Vol. II, No. 2, No. 4; Vol. III, No. 2, No. 3; Vol. IV, No. 1.

‡ See Wilkinson, *Ancient Egyptians*, III, p. 133, 3rd edition. The evidence is complete in the *Grammar of the Lotus*. See chapter on "Lotus Forms Mistaken for Nelumbiums", pp. 25-40. The error also occurs in Perrot and Chipiez, and has been general. My own quoted publications which preceded the Lotus Grammar are also in error on this point.

* See J. Norman Lockyer, "The Dawn of Astronomy, A Study of the Temple-Worship and Mythology of the Ancient Egyptians (1894); pp. 162-3 and others.

† For the use of this word see, for instance, J. Norman Lockyer, The Early Temple and Pyramid Builders, *Nature*, May 18, 1893; reprinted in *Smithsonian Reports*, July, 1893, p. 95.

ren, of the discovery and survey by Pennethorne, in 1832-33, of curves in plan, convex to the court, in the second temple court at Medinet, Habou.* With the exception of Auguste Choisy (*Histoire de l'Architecture,* 1899), and my own publications, this most important matter has otherwise been generally ignored. It not only has obvious and serious bearings on the problems offered by the Greek refinements, but also bears on recent observations of similar curves in plan in many mediæval cloisters.

Under the chapter for Mesopotamia it may be noted that various authorities are disposed to hold that the dome (as well as the vault) was known to ancient Assyria, whereas Professor Warren holds (p. 91) that "there is no evidence of any such use." We need not go farther than Sturgis to find a contrary opinion.†

The chapter for Persia does not remark the notable and decisive appearances of Egyptian architectural forms in the buildings of Persepolis. This evidence is to be found especially in photographs which were unknown to the earlier European authorities, and later writers have usually followed the beaten track in this particular, as the actual visitors to Persian sites have been few and far between. Hamlin is, however, a notable exception to the habitual oversight and also verifies the fact by illustration.‡

Our review now reaches some incidental particulars of the chapter on Greece. Aside from the matter on the origins of Greek ornament, already criticized, the general verdict of this reviewer is unstinted praise, but some oversights may still be mentioned. Naucratis was not founded on the site of Alexandria, as stated at p. 261. It was at Nebireh, about 50 miles to the southwest.

In speaking of the Doric temples of the archaic period it is stated (p. 202) that "the intercolumniation of the side is often much narrower than that of the front." This is true, but the converse fact ought also to be mentioned that the intercolumniation of the fronts is often systematically narrower than that of the flanks. This holds of the Basilica at Paestum, which has an average increase on the sides of 9 inches for each spacing, and the following temples have similar arrangements—Temple D at Selinus, with an increase of 5½ inches; and Temple F at Selinus, with an average increase of 5 inches. The sixth century Greek temple at Pompeii, and the sixth century Greek temple near Metaponto (The Tavole Paladine) show minimized phases of the same peculiarity. The Poseidon temple at Paestum also has systematically wider spacings on the sides, with an increase over the fronts of one inch.* According to this showing there does not appear to have been any preference for the system of making the front intercolumniations wider than those on the sides, as only about seven instances can be quoted for this method to which Professor Warren's mention is confined. To realize that both methods were used indifferently is important, as it would then appear that there was no special cause for the front widening as opposed to that of the flanks. The reason for both systems would then appear to have been a preference for the optical interest created by inconspicuous asymmetry. In this connection it ought to be remembered that the cause for abandoning this kind of asymmetry was the introduction of another kind, viz., the spatial intercolumnar diminutions at the temple angles involved in the problem of the angle triglyphs.†

In the description of the sixth century Temple C at Selinus it is stated that "the spacings of the columns are slightly irregular, as are the diameters." As a matter of fact the maximum variation of intercolumniation on the north side of Temple C is 8 inches, and the maximum variation of columnar diameters is 8½ inches.‡ This is much more than a "slight irregularity," and it is the greatest unsystematic variation of corresponding spaces known in archaic Greek art. The maximum irregular discrepancy of spacings in the Hera temple at Olympia is 5½ inches. Professor Warren has correctly quoted in figures the average increase of the front intercolumniations (of Temple C) as compared with the sides, as being about 22 inches. His statement that the columns in the Basilica at Paestum "are evenly spaced" (p. 215) appears to overlook the nine-inch increment of intercolumniation for each space on the flanks, but is true of the columns of any one side taken together, outside the limits of a mason's error not exceeding 2½ inches.

These minor corrections may be considered worth while because Koldewey and Puchstein are our sole reliable authority for measured surveys of the Italian and Sicilian temples. Their results were not published until 1899, and unless translated must remain unknown to students who do not read German. In so far as inaccuracies are committed or suggested in the use of their results it is best to point it out. It is one of Professor Warren's great merits that he has made a generous use of this unique authority, and a reliable one with the rare exceptions noted.

In the preliminary account of the Doric order

*See Sturgis, pp. 39, 40 with plan. See also Pennethorne, *Geometry and Optics of the Ancients* p.81 (1878), and Goodyear, *Greek Refinements,* pp. 23, 24, 34-41 (1912).

† *History of Architecture,* Vol. 1, p. 64, with an illustration.

‡ *History of Ornament,* p. 67 (1916).

*See Goodyear, *Greek Refinements,* pp. 177, 178, 188 for references to Koldewey and Puchstein.

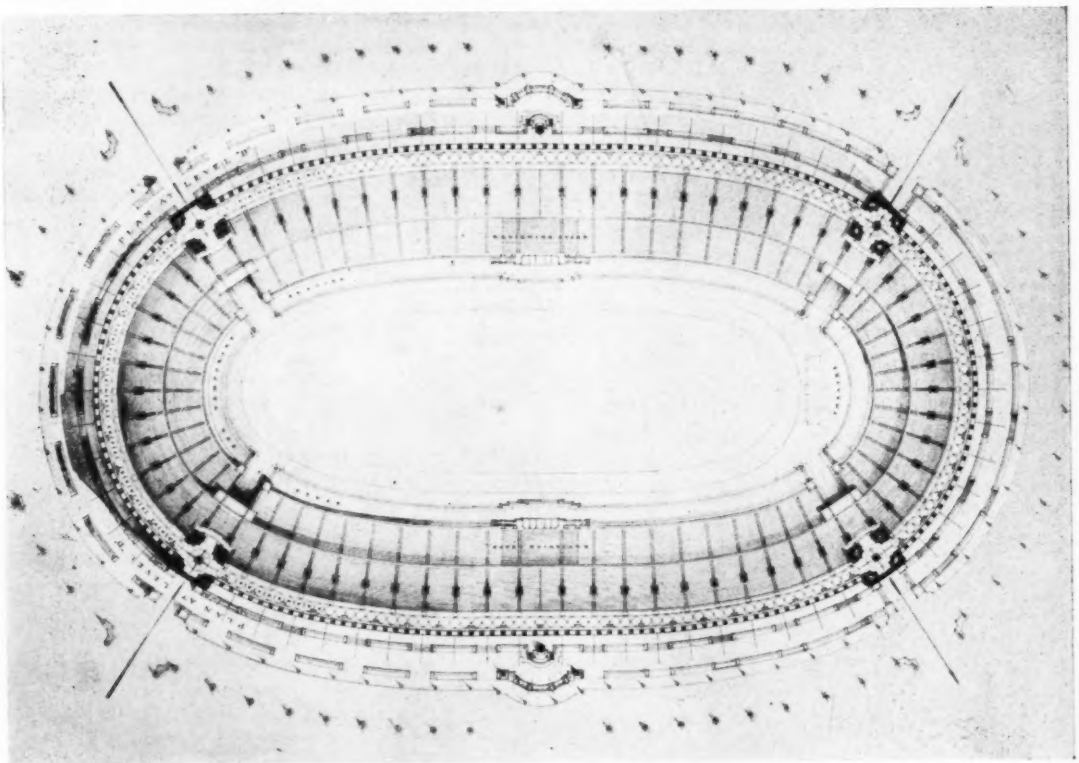
† See Goodyear, *Greek Refinements,* pp. 186-187.

‡ See Goodyear, *Greek Refinements,* pp. 175, 176, for references to Koldewey and Puchstein.

it is stated, as regards the correspondence of triglyphs and columns, that "all the other columns (aside from the angle columns) are so placed that the center of each column is vertically on a line with the center of a triglyph, usually of each alternate triglyph." This statement is corrected by implication in the text supplied by Professor Kimball relating to the Parthenon, where it is stated (p. 329) that: "Although the triglyphs do not come quite on axis with the columns, they are delicately adjusted, so that no awkwardness is felt." It is usual, as is done here, to attribute these delicate dislocations to the problem of the angle triglyph and the related intercolumnar spatial diminutions at the temple angles.

Commendable attention is given throughout the chapter on Greece to the subject of the columnar entasis, which is more frequently lacking in Greek temples than may be generally realized. Each instance of the absence or presence of the entasis is specified. Instances of horizontal curvature are also frequently mentioned, but the curves in plan in the Poseidon temple at Paestum (convex to exterior on the entablature of the flanks and concave to exterior in the entablature under the gables) are not specified, although the horizontal curves in elevation of the same building are mentioned. There is also no mention of the horizontal curves in elevation of the temples of Concord and Juno Lacinia at Girgenti. In justice to Professor Warren it ought to be added that Koldewey and Puchstein have also ignored the curves in plan at Paestum and the curves in elevation at Girgenti, the observation of which is mentioned in my *Greek Refinements* (1912). Jacob Burckhardt quoted the convex curves in plan at Paestum as long ago as 1855. They are also mentioned by Marquand's Greek Architecture (1909).

The general subject of the greek refinements is ably treated by Professor Kimball in his matter for the Parthenon, where they have been most completely surveyed. It is gratifying to notice that Professor Kimball has ignored the popular but incorrect opinion that there is an optical effect of sagging in a long horizontal line, and that the Greek horizontal curves in elevation were intended to correct this optical illusion.



PLAN
COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO
MARSHALL & FOX, *ARCHITECTS*

Public Opinion and City Planning Progress

By JOHN NOLEN, *City Planner*

TO stimulate interest and make clear the need of city planning is an important part of the task of establishing new ideals and new standards. It is a publicity job, this work of making intelligible to the public generally what city planning really means. We must aim to get all who are interested in their community to see the planning of a city in its simple, practicable and financially advantageous outlines.

The making of public opinion for city planning is like making public opinion for pretty much anything else. It is done through the newspapers, by public exhibitions of plans, by moving pictures, if they can be made available, by the printing of reports, pamphlets and popular leaflets, by public meetings, illustrated lectures, the use of the stereomotorgraph and attractoscope, and free and wide discussion. One important thing to discuss is the financial results of city plans—that in a big sense, city planning pays. That might be the first appeal. The second appeal is almost opposite. It is the appeal to sentiment, to idealism, to loyalty to one's own community. It is surprising how quickly business organizations, such as chambers of commerce and boards of trade, respond on the ground that city planning promotes the city's welfare. The third appeal is to the imagination. It is the need of actual plans. It is necessary to visualize as graphically and attractively as possible various proposals for improvement, especially as related in comprehensive schemes. The final appeal is that of an object lesson, something actually done, even though it is but a small part of the general plan. This involves the execution of a park, a playground, a garden suburb, a viaduct, a better type of bridge, a union station, a civic center—some feature, but with reference to the whole plan. Such an object lesson will often convince the most skeptical, even those whom the other appeals do not reach.

It is sometimes said that city planning schemes are not carried out. To some extent this statement is true. The execution of comprehensive city plans requires time, often a generation; also money, large sums; also authority, sometimes a change in the state laws or even in the state constitution; also the formation of favorable public opinion. Horace Bushnell, in his agitation for the first city public park in the United States, said, "Many things must be carefully prepared, as carefully watched, and persistently pushed, by the man who will get any city public into and through a great public improvement. Wearied, and worried, and hindered, he must never sleep, never be beaten, never desist, and if, by a whole five years of toil, he gets his work on far enough to become an interest in itself, and takes care of itself, he does well, and there may rest."

The answers received from a questionnaire sent out recently to more than a score of cities, uniformly emphasizes the same conclusions with regard to the success or failure of city planning proposals. Careful examination of the responses shows that the degree of success is dependent on a regard for and adherence to certain principles. The solution of the whole problem seems to lie in diplomatic, carefully planned, and if need be, a long extended campaign of education aimed to reach not only the well informed and prominent elements of the community, but also the laboring classes and the public at large. In other words, the success of the commissions, from replies which were received, may be graded by the progress of such campaigns of education in their towns and cities.

To one who is familiar with the natural and formidable obstacles to the execution of comprehensive city planning projects and the progress that has been made already, the astonishing thing is that so much has been done, especially in the smaller places. In some cases, as for example, Glen Ridge, N. J., and Walpole, Mass., virtually all the proposals have been carried out, or are definitely authorized for execution. In other cases even though the city plan commissions were not able at the time to get the approval of their recommendations, the plans have been partially executed by the city council or other public authority. The words of Daniel H. Burnham have often proved true: "A logical diagram, once recorded, will never die, but long after we are gone will be a living thing, asserting itself with ever-growing insistency." Furthermore, the city planning movement, it should be recalled, is still in its initial stages. Its merits are not yet clearly understood by the general public, and very little money is available for the making of careful plans, based upon reliable surveys, and the publicity necessary "to sell" those plans to the people for whom they were prepared.

With the possible exception of Chicago, no town

or city in the United States has yet taken city planning seriously. Chicago's methods have been more logical, more persistent and more systematic than those of any other city. The whole story is convincingly presented in Walter D. Moody's recently issued book entitled "What of the City?" published by A. C. McClurg & Company, with the sub-title "America's Greatest Issue—City Planning, What It Is, and How to Go About It to Achieve Success." Some of the main facts to record in the program to "put across" Chicago's City Plan are the following:

1. The printing of the report on "The Plan of Chicago" at a cost of $85,000. This was in the form of a beautiful octavo volume, the very finest example of printers' craftsmanship. It contained 164 pages and 134 drawings, charts and pictures, including 15 full-page, six-color drawings painted by the famous artist, Jules Guerin.

2. The publication of a booklet entitled "Chicago's Greatest Issue—An Official Plan." The basis of this publication was the de luxe Chicago Plan book, issued by the Commercial Club. Many of the drawings of the parent book were adapted to the smaller one. Its 93 pages, carrying the 328 names of the members of the commission, representing every walk of life in the city, told the story of the Plan of Chicago to all the people in simple, easily comprehended, everyday language. Copies numbering 165,000 were issued and distributed at a cost of $18,000. These were delivered to every property owner of the city and to persons paying a rental of $25 per month and over. "Chicago's Greatest Issue" was sent, on request, all over the civilized world.

3. A notable pamphlet was printed and issued, entitled "Fifty Million Dollars for Nothing." It showed the people of Chicago how they could obtain 1300 acres of lake front parks, playgrounds and watercourses by utilizing the waste material of the city. It pointed out that by so doing the city could secure in twelve years park lands ready for development and worth fifty million dollars at no cost whatever to the taxpayers.

4. There were many other special pamphlets and reports, but to cap all, the Commission issued a publication entitled "Chicago's World-wide Influence in City Planning." It was an effort to "keep the home fires burning" with community confidence and devotion to its own plan as it was regarded by the rest of the world. This was a compilation of comments and requests for Chicago Plan literature from hundreds of experts, civic workers, municipal authorities, libraries, schools and public-spirited citizens, received by the Commission from all over the world.

5. Following the signing of the armistice in the great war and the announcement of the reconstruction platform of the Chicago Plan Commission, to which the Chicago newspapers devoted twelve columns, an appeal was made to the clergy of the city to preach from their pulpits upon the humanitarian benefits of the Plan of Chicago. The Commission's "Seed Thoughts for Sermons" pointed out the close harmony between the social workers in the churches and the benefits in the plan. This document, together with a resolution and the reconstruction platform, was sent to every clergyman in Chicago.

6. As a direct result of the admonition "Establish the Plan of Chicago with the People." a school text book was printed, entitled "Wacker's Manual of the Plan of Chicago." This came as an inspiration. The Plan of Chicago text book was adopted by the Chicago Board of Education in 1912. The first issue was 15,000 copies. It was used as a part of the curriculum of the eighth grade course. The school authorities followed the wish of the plan executive, whose conviction it was that a larger number of students could thus be reached. It was believed, too, that there was value in an appeal to the children at their most impressionable age. More than 50,000 copies of Wacker's Manual have been published for the current needs of the school.

7. After the school book came the lecture bureau. A popular lecture, showing more than 200 pictures of twenty-four countries of the world, was most carefully prepared, and critics say it compares favorably with the popular lectures of the day delivered by professional speakers. The Board of Education placed the assembly halls of the schools at the disposal of the plan officials without price. How to attract the people to the Plan of Chicago lectures was the task. The difficulties, however, were finally overcome. As many as 150,000 circular announcements of the lectures were mailed to citizens in a single season. Nearly a hundred school lectures were delivered in one year. The schools were selected in order and equitably covered the city. This method was continued from year to year, and during the first seven years of the Commission nearly four hundred lectures were delivered. One hundred and seventy-five thousand people have been directly reached with the plan message; that is, one in every fourteen residents of Chicago.

8. One of the chief aids to the effective publicity for the Plan of Chicago was a motion-picture campaign. This consisted of a two-reel feature entitled "A Tale of One City." It contrasted the plan proposals with existing conditions, and was interspersed with scenes of human interest and attraction

about Chicago. The reels were shown in more than sixty Chicago theaters to an estimated audience of more than 150,000 people. The opening was at the Majestic Theater to an audience which packed the house to capacity and was as representative as a grand opera occasion.

9. The most valuable medium of all for publicity for the Plan of Chicago has been the newspapers. Publishers, editors, reporters, feature writers and cartoonists have co-operated intelligently, heartily and generously to carry to the people of the city the great ideas and the far-reaching benefits contained in Chicago's Plan. One of the papers prints daily at the top of its editorial column its platform, which contains a persistent endorsement of the Chicago Plan, and an appeal for its support. As Wendell Phillipps has well said: "The newspaper is parent, school, college, pulpit, theater, example counselor, all in one. Every drop of our blood is colored by it. Let me make the newspapers and I care not who makes the religion and the laws."

This is not by any means the whole story of Chicago's publicity, but here are given the nine main points. Chicago's publicity campaign on its great plan has been big, far-reaching, inspiring and effective. Behind the conception of a city plan is recognized the necessity to stir the hearts of men, and to inspire in their minds that desire for better city conditions which are the fruits of well executed city planning. Finally, it shows what is necessary to awaken the people to the need of city planning, and how they can be moved to action.

One question remains. Assuming that a publicity campaign is an indispensable feature of a city planning program, how can that campaign be best organized and carried out? Should the work be inaugurated and directed by the city planner, by the city government, by the city plan commission or by some other body? The city planner is not a professional publicity man, and he is often—in fact, usually—not a citizen of the city for which the plan is prepared. It would seem that his contribution would necessarily be limited to the preparation, in as popular a form as possible, of his plans and reports, together with, perhaps, a personal presentation of those plans and reports to a public audience. After that his active participation in a local educational campaign would be of doubtful expediency.

The city authorities, especially the city plan commission, should be relied upon wherever there is a well organized city planning agency to outline, direct and execute the education campaign that must accompany any large city planning program. In no other way can the presentation be wide enough nor the discussion authoritative and far reaching. The city planning authorities, however, cannot hope to be thoroughly effective unless they can secure the active co-operation of the voluntary social, civic and other groups of citizens. The whole public can be effectively reached only by the assistance of chambers of commerce, women's clubs, labor unions, Y. M. C. A., churches and other organizations to which the people of the city are accustomed to look for information and guidance.

The Best Sort of Client

ONE frequently hears, states *The Architect* (London), discussions among architects as to their clients, and sometimes those which take place among clients as to their architects. The employer and the employed naturally take individual standpoints, but from many criticisms it may be possible to arrive at some general conclusions.

To start with, an architect's client, while not possessing the wealth of Monte Cristo, should certainly have enough money to pay for what he wants without undue strain, for the architect who tries to obtain a quart of requirements within a pint measure is doomed to disappointment and difficulty. At the same time it is by no means certain that a client whose wealth exceeds the utmost dream of avarice is an easy client to deal with, for, as we may have too much of a good thing, there is such a thing as an actual *embarras de richesse*. But architects and clients both vary, and the best client for one architect is not necessarily the best client for another. Some of us can place ourselves without much difficulty in the position of our clients, and others cannot. For the first class of architects it is better to have a client who does not define his views and wishes with absolute precision and finality, while another architect will do his best work within narrower limits. In a word, if a man has imagination and insight his best work will be the result of being given a free hand, while other good architects may actually do their best work in giving shape and form to definite conditions laid down by their clients.

As to the vexed question as to whether it is best to work for clients who "know something about architecture" or those who do not, it seems to us to depend on whether the client realizes how little he really knows or whether, on the other hand, the little knowledge becomes a dangerous thing, making the client autocratic and unmanageable. The worst type of client is the man who having seen Hatfield wants its features reproduced in a £2,000 house, and such men will give their architects many a bad half-hour. And as most architects looking backwards on earlier stages can remember the time when their great delight was to "distinguish the different styles," and reproduce their most salient features in student's design, crowding much detail into small space, so the client who has absorbed a little elementary knowledge is very often apt to press his architect in the direction of introducing features which were better omitted. The dreaded element of "cost" is usually in such cases the flaming sword which protects the independence of the architect, who with a little tact can refuse to introduce features he does not wish to have, because the limit-cost renders it impossible, without indicating that he disagrees with his client's taste. One difficulty both with clients and architects is that knowledge and taste are two different things, not always combined in the same individual. We have known of designers whose ability is unquestionable but whose taste is questionable, and who for that reason never quite achieve distinction, while many with less executive ability have an instinctive judgment of what is fitting and suitable in any given case, and in the same manner some clients judge the result of architects' work by a species of mental appraisement, as they possess the instinctive taste to recognize what is good. The result is that we constantly see carefully detailed and well thought out buildings which fail to please us, while the best work which delights us appears to have grown naturally out of the soil on which it has sprung and out of the circumstances which dictated its erection.

We are inclined to think that the best clients are those who possess fairly definite views but who convey them to us by telling us what buildings they admire, and then leave a free hand as to as many of the conditions of the actual problem in hand as possible. A well-known architect told us that when engaged to design an important building for a client he asked to spend some weeks with him that he might judge the sort of house which would best satisfy his wants. Such a process no doubt is useful, but in many cases impossible; most architects in building for men they have known for some time have recollections of many small observations which should render it easy to satisfy their clients on points on which they have no specific instructions. The architect should, like a doctor, be able to diagnose a case from observation rather than from any definite information he receives, and the most successful man and his best work will usually be the result of such observation.

The present times are likely to prove the architect's discretion to the utmost, for it is difficult, and in some cases almost impossible, to make a client understand that the old rate of prices is gone, and that none of us can tell whether in the future we shall approximate to them again. The client is apt to feel that high prices are occasioned by the architect's want of skill, and that greater mental ingenuity would find a way out, but the broad facts that prices are 150 per cent more than they were takes away the architects's chance of proving himself a *deus ex machina*.

To sum up, the best clients seem to us to be: first, those who do not wish their architects to attempt the impossible; second, those who have taste and a certain amount of knowledge; and third, those who tell their architects what they admire or like rather than tie them down with definite instructions; but all of these several elements are qualified by the amount of insight possessed by the architect in question.

EDITORIAL

In order to supply our readers with material of current interest, the news and comment appearing in issues of THE AMERICAN ARCHITECT delayed by the printers' strike will be as of actual rather than stated date of publication.

Popularizing Architecture

THANKS to Mr. D. Knickerbacker Boyd, more than two millions of readers have, through the pages of the *Ladies' Home Journal,* become familiar with the most interesting to the lay public of the existing documents of the Institute, thus reaching the very class of readers that would be most concerned with them. It is also interesting to note that this very valuable propaganda was not carried forward in any way by the Institute, an opportunity it unfortunately has failed to avail itself of.

As far back as 1914, the Committee on Publication of the Institute was instructed by the Board to publish in the *Journal* a series of articles that could be reprinted for the information of the public on "How the Owner Should Approach a Building Project," and similar articles for the dissemination of general instruction. Nothing ever came of this, and it has remained for some one, outside the official representation of the Institute, to take up this important work.

"All's well that ends well," as far as the ultimate result is concerned. While the *Journal* has been giving expression to the most abstruse discussion of academic topics, recounting its beautiful experiences while journeying through the Sacramento Valley, or describing the thrills of a first aeroplane flight, some outsider has taken up and very thoroughly performed a valuable service that the *Journal,* it would appear, was long ago instructed to perform.

Carillons as War Material

Carillons, or chimes of bells, located in well-designed campaniles or towers are forms of memorials that should strongly appeal to architects. Until the publication of a letter addressed to the New York *Times,* in which this form of memorial is strongly urged, we have failed to note any effort to revive the custom of bell-ringing, now practically dead in this country.

Here in New York on New Year's eve the custom yet continues of "ringing the old year out and the new year in" on the chimes of Trinity church. Hundreds of people congregate there at midnight to hear these chimes. The custom is a good one, and one of the few that link New York to-day with that of fifty years ago.

The carillons of Belgium are famous the world over and Joseph Denys, perhaps the last of a famous number of bell-ringers, yet delights great numbers of people by his masterly handling of these large groups of bells. The number of bells in a carillon varies from 10 to 40. The famous group at Ghent has 48. Many of the most famous carillons in France and Belgium were destroyed during the war. These will be replaced in many instances.

IN this country the days when the peal of church bells marked Sunday and a day of rest have passed. We have too many important night workers in all large cities, whose hours for sleep are governed by their working hours and the day-long Sunday ringing of bells and the early morning calls to prayer were found to be disturbing. Unfortunately the ringing of church bells has been discontinued and the reverberation of their brazen tongues no longer fills the air with calls to worship. Under proper regulation the carillon or chimes may be again restored as one of the most beautiful features of life both in and out of town. Let us not outgrow all these old and good customs that add joy to life.

It therefore seems possible to employ the well-designed bell tower as a memorial to our heroic dead with the most satisfactory results.

These towers could find location in parks of cities, on the commons or "greens" of surburban towns. They would become visual evidence of a

community's gratitude to its heroic sons and its sweetly toned bells could ring forth anthems of praise or patriotic melodies on our many anniversaries. There could also be found among the musically inclined enough men to master the manipulation of these bells, and there might well spring up a friendly rivalry as to the respective merit of the carillons of different locations and the musicians who played upon them.

The Passing of Old Landmarks

COMMENTING on the passing of the bells and bell towers in Europe and in this country, one is reminded that the so-called march of progress sweeps aside many long-venerated customs, many famous landmarks.

There were comparatively few in this country, and they are fast disappearing. In the older cities on our Eastern seaboard the material evidence of our Colonial days is rapidly being swept aside. Where once the well-designed house, public tavern, or church of long history stood, is now the location of towering buildings given over to trade or apartment dwellings. While it is not reasonable perhaps to contend that land that has become so valuable should be given over to unremunerative purposes to cater just to sentiment, those who venerate these early examples of our national life cannot repress the expression of regret.

In Europe where the old landmarks are more common, the regret and frequently indignation expressed at their passing often becomes pathetic. It is learned that the world-famous Moulin Redet, which for centuries has crowned the heights of Montmartre, is to be removed to make room for the erection of new houses. Every artist will declare that the picturesqueness of this spot will at once be destroyed. Sentiment has become so strongly aroused that an effort is being made to secure the removal of this old mill to another site.

For many generations artists have visited this picturesque height of Montmartre, and thousands of sketches exist of the Moulin Redet.

It is noted with considerable satisfaction that the veneration of our old landmarks is not entirely dead. Graduate chemists of the Pennsylvania State College have subscribed to a fund to purchase the historic house of Dr. Joseph Priestly, famous as a chemist and the discoverer in 1774 of oxygen. This house is located on the Susquehanna River, near Northumberland, Pa. It will be removed to the campus of the college, carefully restored and maintained for all time in good order. In its present location, where it was built 138 years ago, it was rapidly falling to decay.

LAKEFRONT, HOUSE OF C. G. EDGAR, GROSSE POINTE, MICH.
WILLIAM PITKIN, JR., *LANDSCAPE ARCHITECT*

Natatoriums

A Discussion of Their Architectural Shortcomings

By Edwin H. ("Larry") Wood

Instructor and Coach of Swimming at the Lewis & Clark High School, Spokane, Washington.

IF our leading aquatic authorities were asked to point out that factor most conducive toward keeping competitive swimming in its present status of a so-called minor sport, they would ascribe it—in nine cases out of ten—to our relatively few and poorly-designed natatoriums.

Swimming—whether we think of it as competitive athletics or as a pastime—is not of itself lacking in those elements that make football and baseball "major" sports. Under inviting conditions—with clean, reasonably warm water, sunlight and pure air, as found at our beaches in summer—more persons swim than actually participate in all other sports combined. But outdoor swimming not being practicable the year round—a few localities excepted—swimming comes to a standstill with the advent of fall; our natatoriums do not duplicate those pleasing features connected with outdoor swimming. Our indoor natatoriums should make swimming as attractive in January as do our rivers and lakes in July. No other sport, major or minor, occupies the unfortunate position in which swimming finds itself. This sport is shut out—automatically excluded—from its rightful place in athletic activity because almost all of our relatively few natatoriums are so badly located and so poorly designed as both to make it almost impossible to create a following for the sport or to accommodate that following if it is created.

I believe—after eleven years' connection with the swimming game, both as an amateur athlete and as a professional coach—that the chief reason underlying these conditions is the fact that the architect seldom consults with an experienced coach of swimming. True, the latter can be of no assistance in the engineering problems involved; but—two heads being better than one—he is able to suggest structural features that only a man experienced in the swimming game—I speak of competitive swimming—is qualified to offer. Pools are no longer merely places in which to bathe; they are places—or, rather, should be—in which to foster a sport unique in its utility and, in its highest stage of development, a most fascinating spectacle.

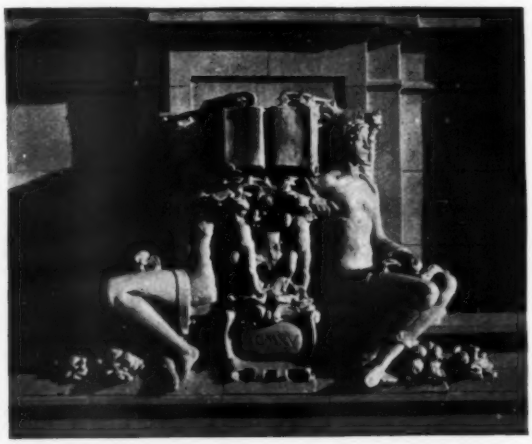
Let me be specific. First and foremost, pools are almost invariably situated in dark, gloomy basements. Here both the problems of lighting and of ventilation are most unsatisfactorily solved. Sunlight seldom enters these underground "vats"; they are almost always dark, smelly and repellent. Contrast with such uninviting places the natatorium situated above ground in the corner of the building. In such location both natural lighting and ventilation are possible. With properly warmed water in addition to plenty of light and air we have the main attractions of outdoor summer swimming. As for the tank proper, it seems to have been the delight of architects who designed the natatoriums of a decade or so ago—and modern ones, too—to cram as many obstructions in the shape of stairs, ladders, etc., as possible. In many pools not over forty-five feet long and less than half as wide, one frequently sees two broad flights of steps occupying opposite corners of the pool with perhaps a couple of ladders in the other corners thrown in for good measure. It would really seem as though the designer thought swimming to be an exercise for only decrepit men and women, too feeble to leave the pool except by numerous and handy exits. (In fact, after having gazed at such examples of pool construction, I have wondered why the architect didn't do a complete job and install elevators.) Stairs have no place in the modern pool; four ladders, set in niches in the sides of the pool, are sufficient. If some sort of "grab rope" is deemed necessary, an iron chain along the sides and ends, fastening in the corners of the pool in such manner that it may easily be removed, should be provided. In brief, a pool should be so designed as to provide a swimmer with an unobstructed "lane" the complete length of the pool. As to the size of the pool, it should be of standard length—60, 75, 100 feet, etc. Standard racing distances are 50, 100, 220, 440, etc., yards; and these distances should be multiples of the length of the pool. It is better to have a 60-foot pool than one of 67½ feet for this reason. The proper shape for a pool is rectangular. Occasionally pool designers try out a few variations. I have one pool in mind, 60 by 18 feet—narrow enough—which the designer made still less suitable for competition by cutting off the corners of

the pool and setting four ladders in diagonally, thus cutting off a good three feet from the ends of the pool and thereby greatly crowding competing swimmers. Another very common mistake in pool design is the use of rounded, glazed tile at the edge. This is not only inconvenient; it is dangerous. Glazed tile is slippery at best; and when it is rounded the feet can get no purchase. The tile at the edge of a pool should be square-cornered and should have a rather rough surface.

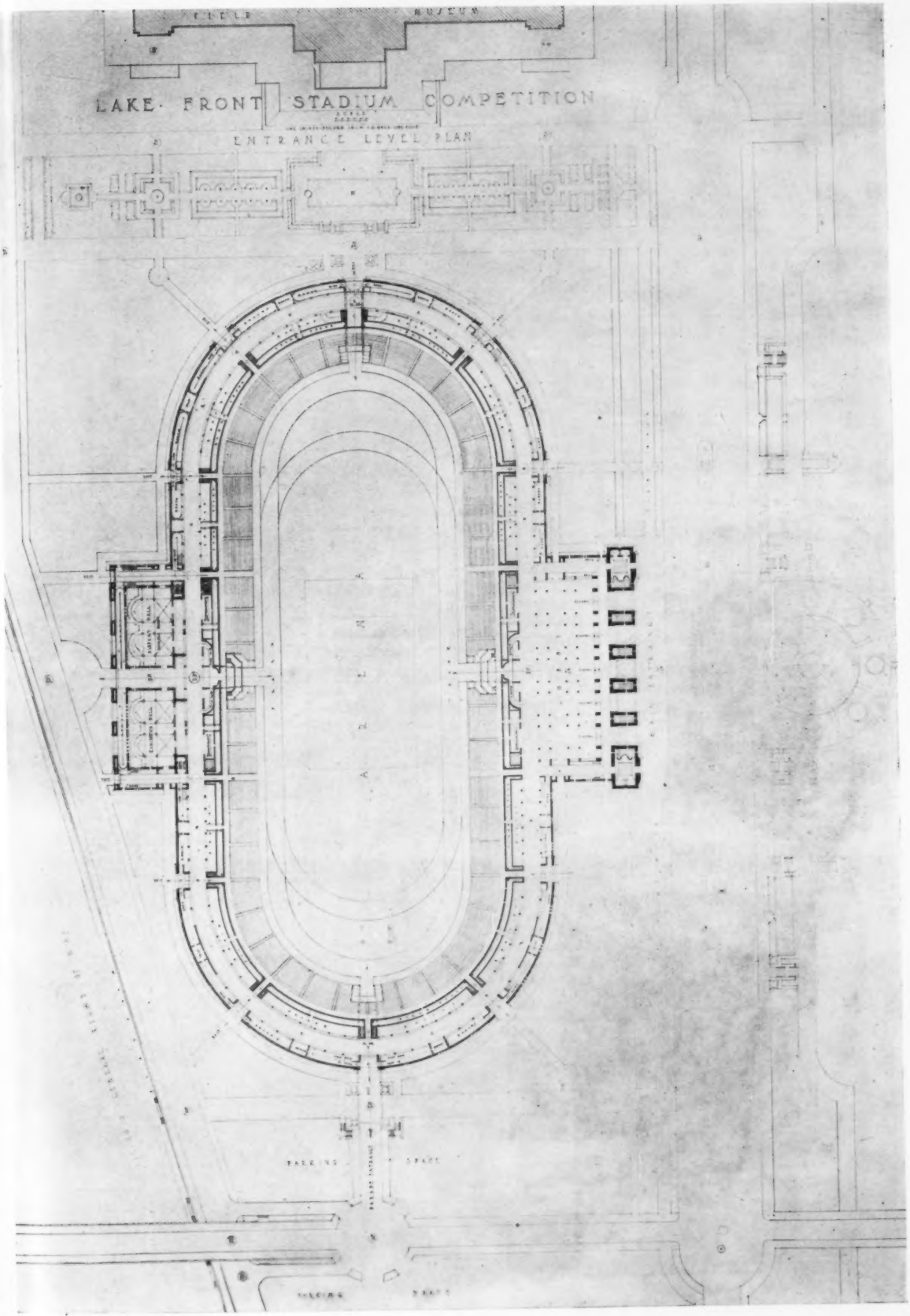
The problem of condensation is ever present. Since the air and the water in a natatorium must be heated to a point far beyond the usual temperature of the outside air, a state of high humidity is inevitable. In severely cold weather condensation is usually apparent on all inside surfaces of the natatorium; and even in mild weather those walls facing the outer air continually "sweat," as does the ceiling in this vicinity. For this reason a natatorium should be full-tiled, or, if it is half-tiled, the better plan is to tile the ceiling and half way down the side walls. Most natatoriums have a tile floor, and the walls are tiled about half way up. The ceiling—where condensation is most abundant—is often entirely neglected in this respect. Certainly, the walls and ceiling should be constructed of moisture-resisting material or at least should be coated with such material. This obvious point often is overlooked. For example, the natatorium of one of our leading Eastern preparatory schools is one of the finest of its kind, containing a magnificent pool, built-in concrete bleachers and numerous other excellent appointments. But its walls are of plaster, and during the severe winters, common to that section, condensation is so heavy as to have practically ruined the walls and ceilings. This natatorium is part of a gymnasium costing ten years ago nearly $150,000. Thus, in building even the most costly natatoriums, blunders such as these are made.

Lastly, no sport can prosper unless it has a following—unless a reasonable number of spectators can be admitted to contests and be seated with some degree of comfort. Most natatoriums have enough space to accommodate not more than twenty-five persons exclusive of competitors and officials. Thus, if swimming does become popular, three-quarters of the "fans" cannot possibly be accommodated; and the sport naturally expires. I realize, of course, that the matter of seating space does not come within the province of the architect; this is a point that is generally decided in advance by the building committee. Here it is that the experienced coach can be of great aid in making members of the building committee see the folly of building a pool which by its very structural features precludes any great amount of interest in swimming.

Even in spite of handicaps such as I have detailed and in spite of other handicaps almost as deterrent to the best interests of the game, swimming is becoming one of our leading sports. Given a fair chance it will one day eclipse our present so-called major sports; and architects can help in this great work more effectively perhaps than any other class of men.



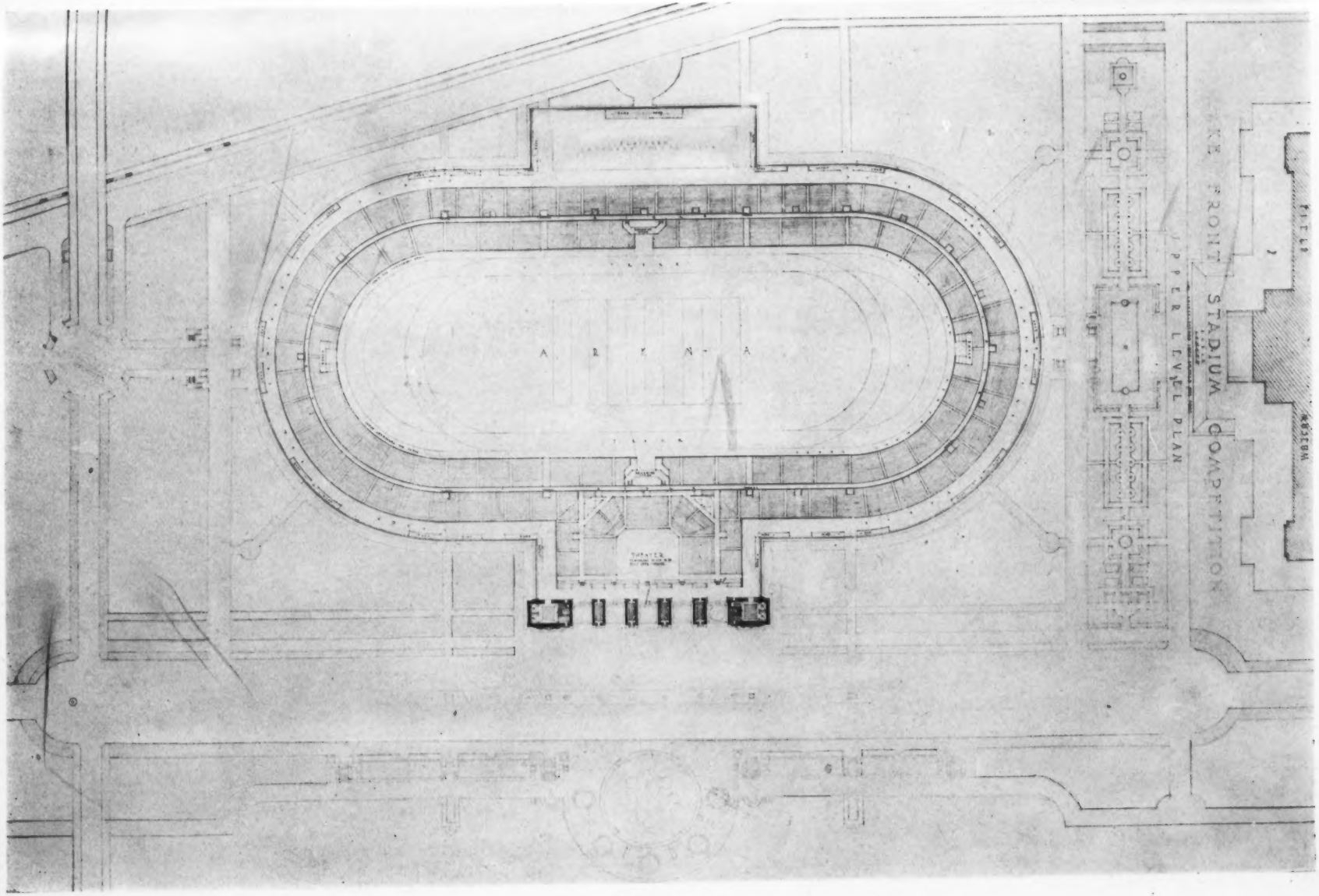
GROUP OVER ENTRANCE TO A LIBRARY IN SAN FRANCISCO, CAL.
LEO LENTELLI, *SCULPTOR*



GROUND PLAN

COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

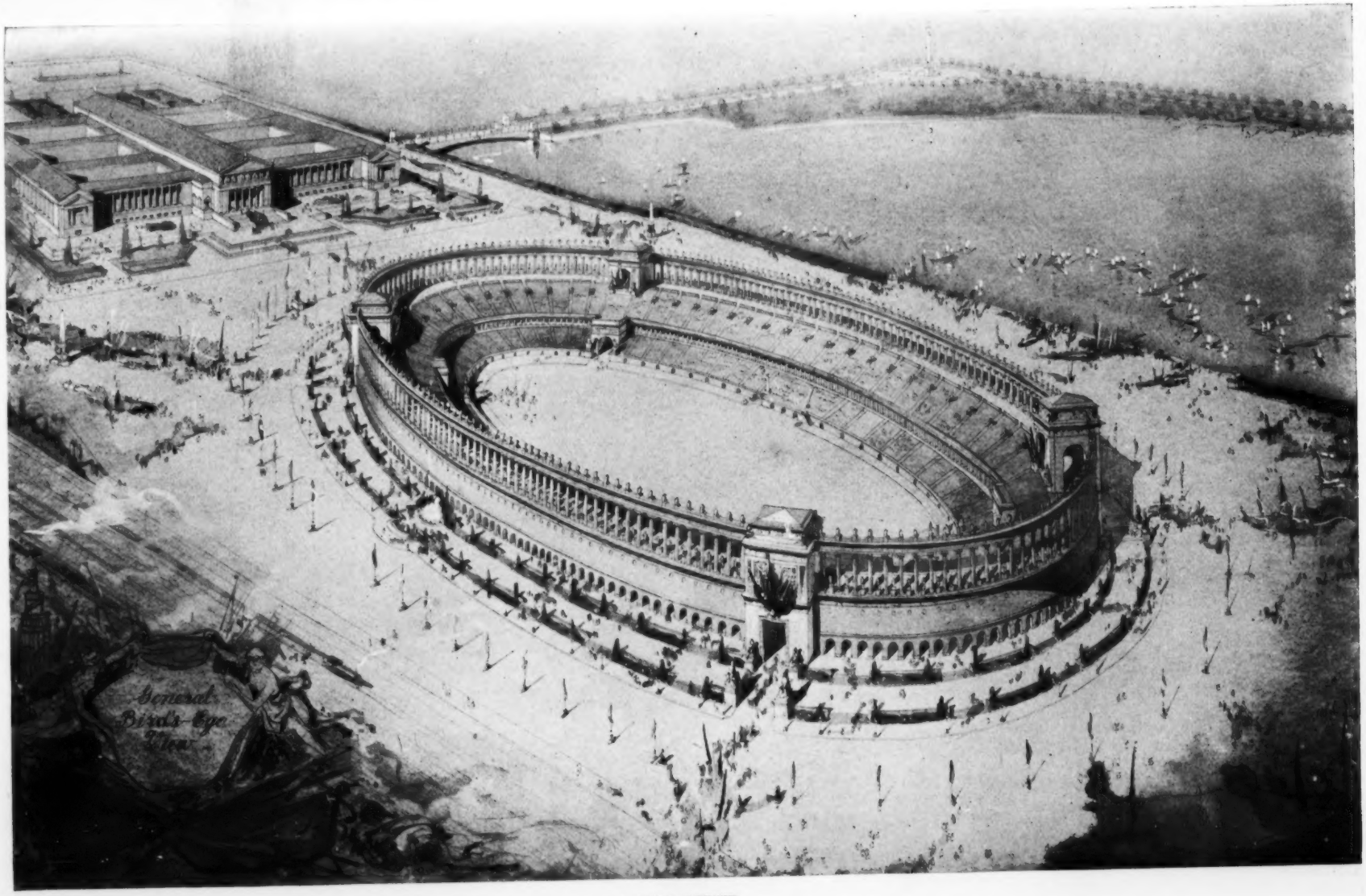
JARVIS HUNT, *ARCHITECT*



SEATING PLAN

COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

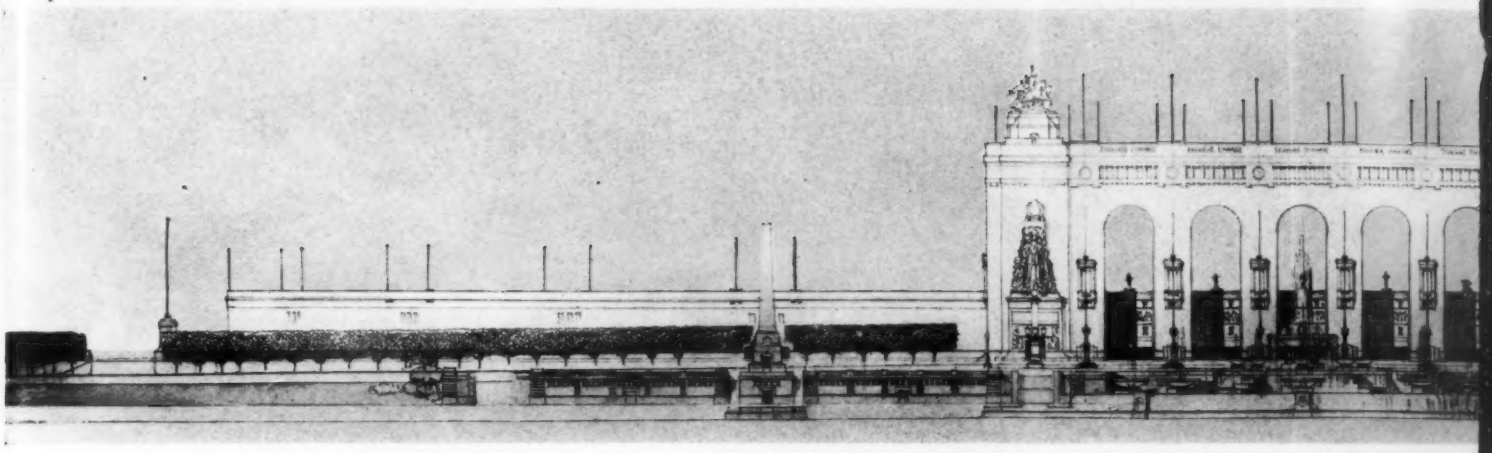
JARVIS HUNT, *ARCHITECT*



PERSPECTIVE

COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

MARSHALL & FOX, *ARCHITECTS*



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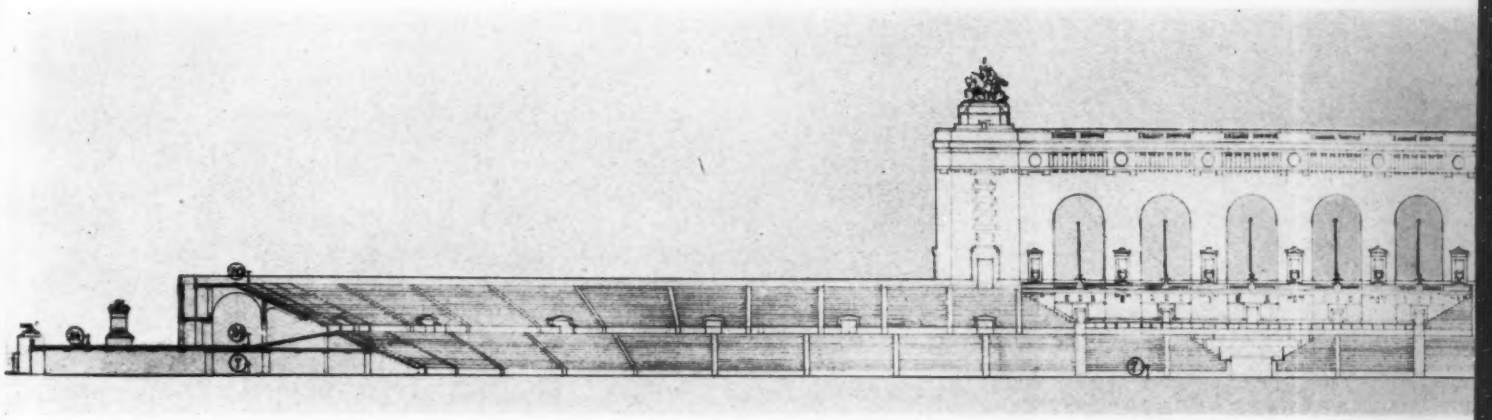

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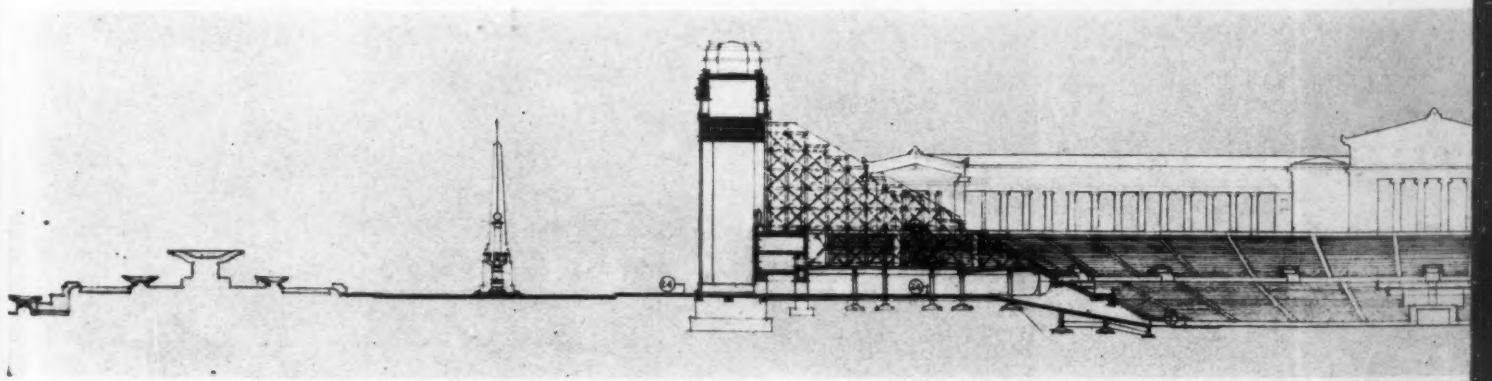

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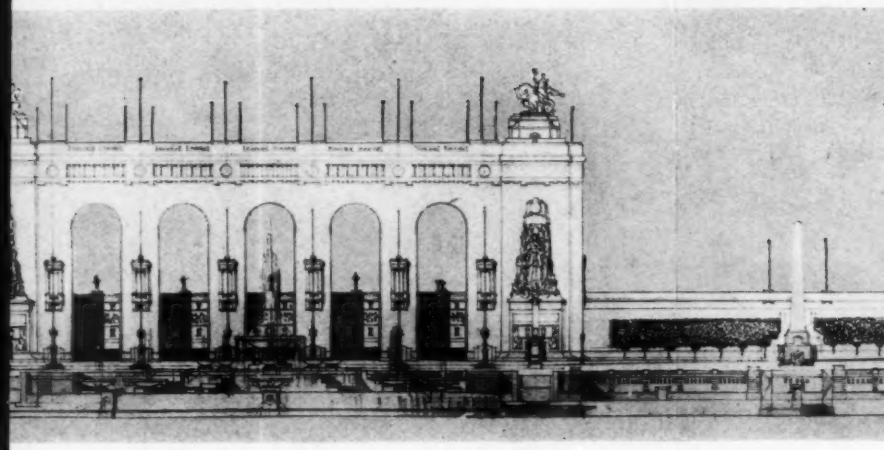
COMPETITION FOR A STADIUM ON THE LAKE F

JARVIS HUNT, *ARCHITECT*



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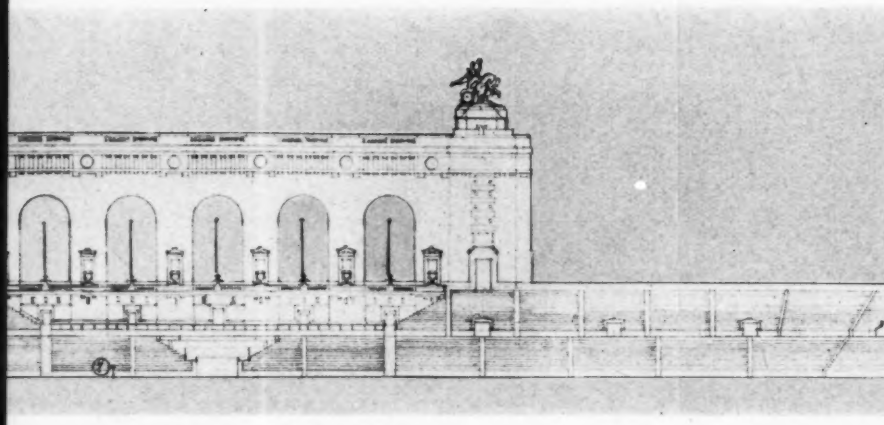
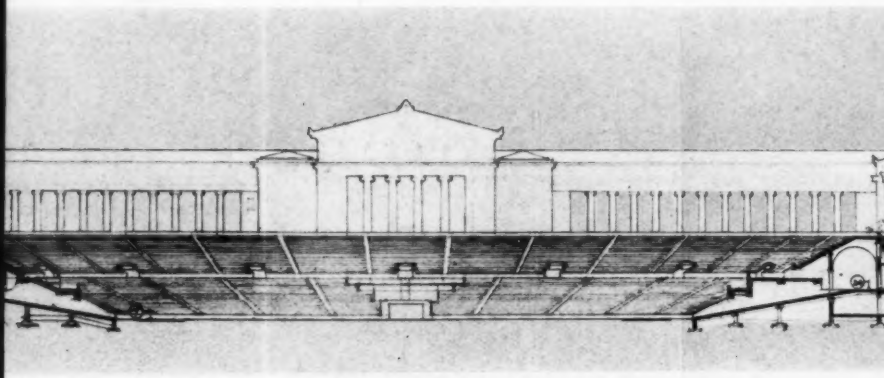


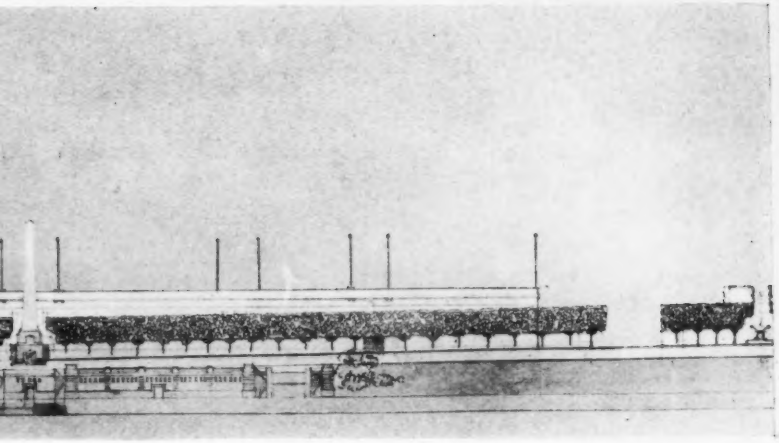
LONGITUDINAL SECTION LOOKING EAST

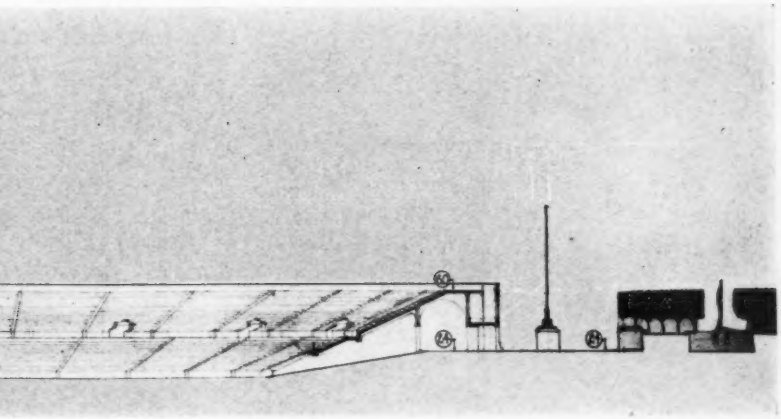


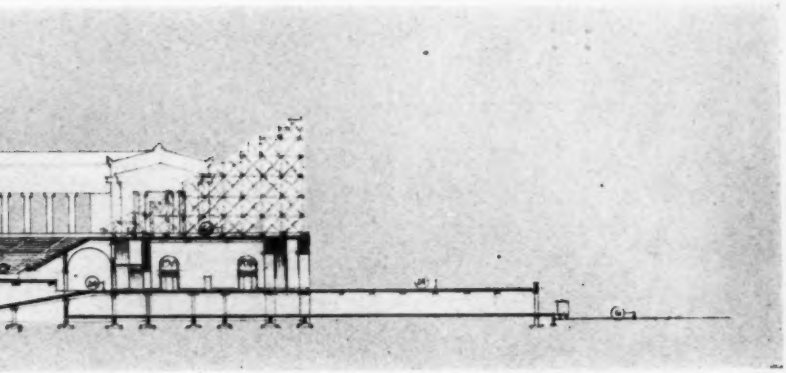
TRANSVERSE SECTION LOOKING SOUTH

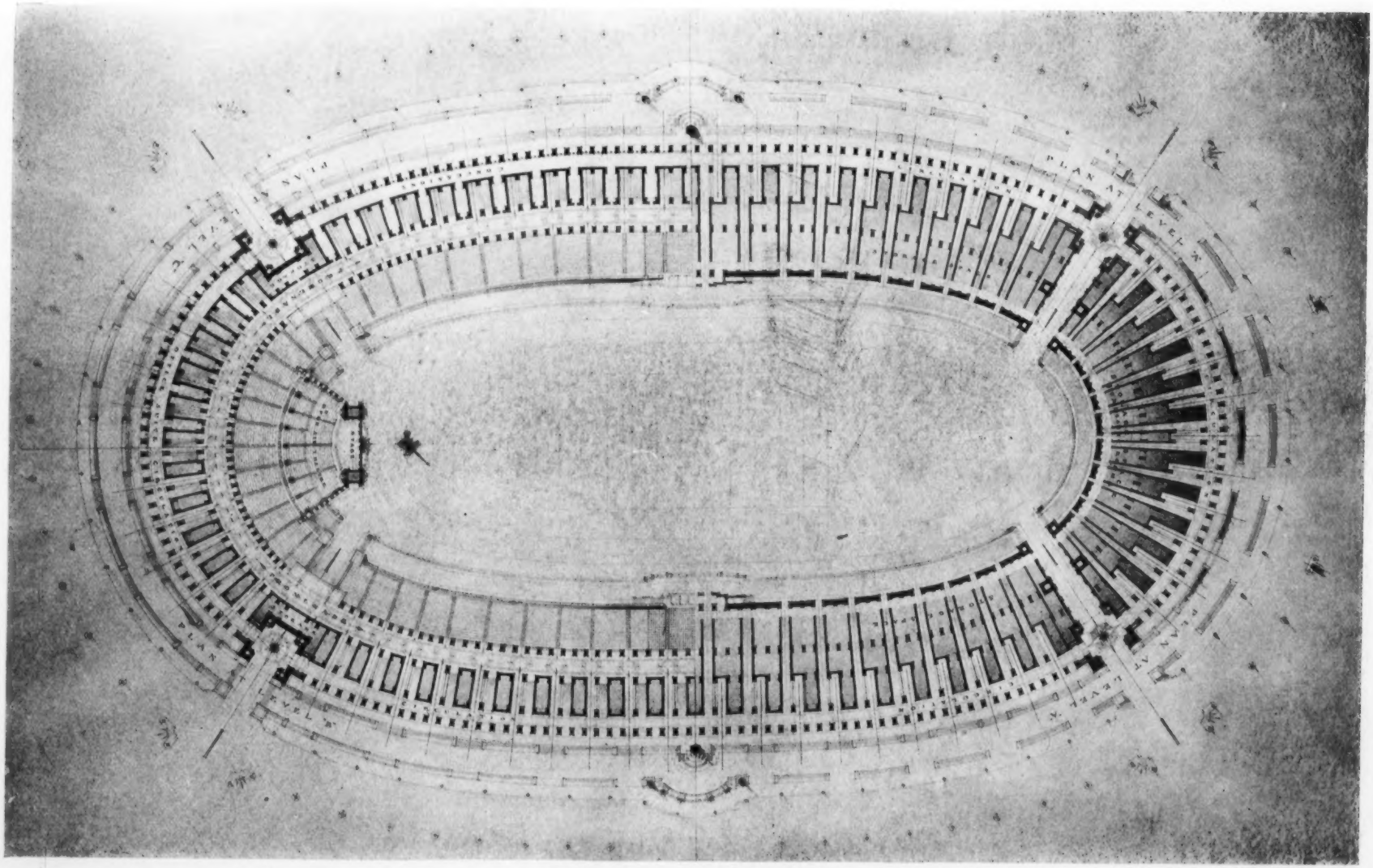
TION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

JARVIS HUNT, *ARCHITECT*





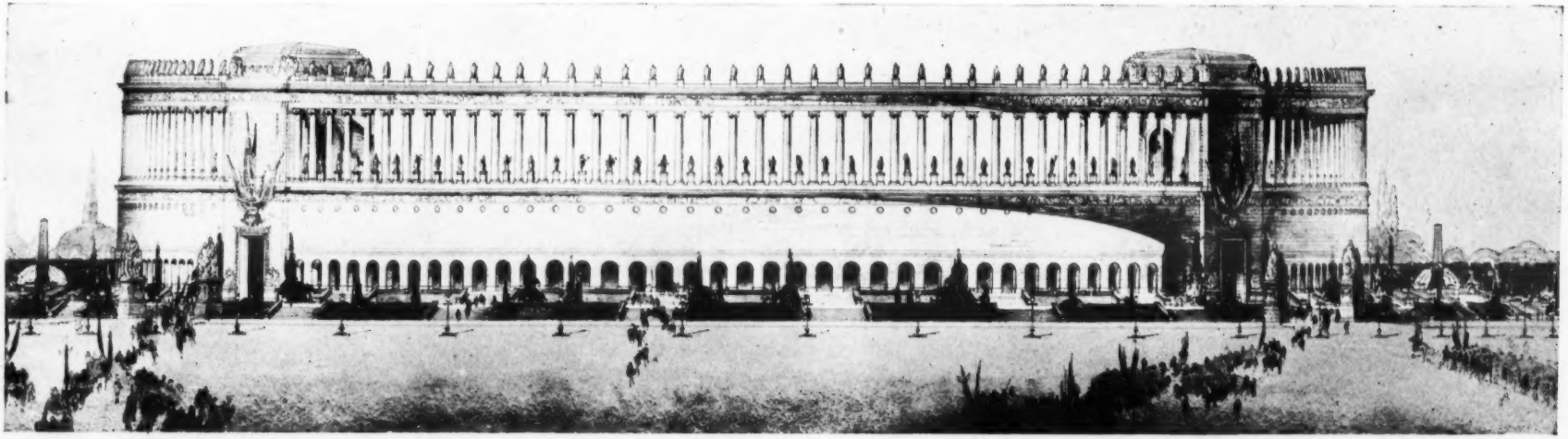




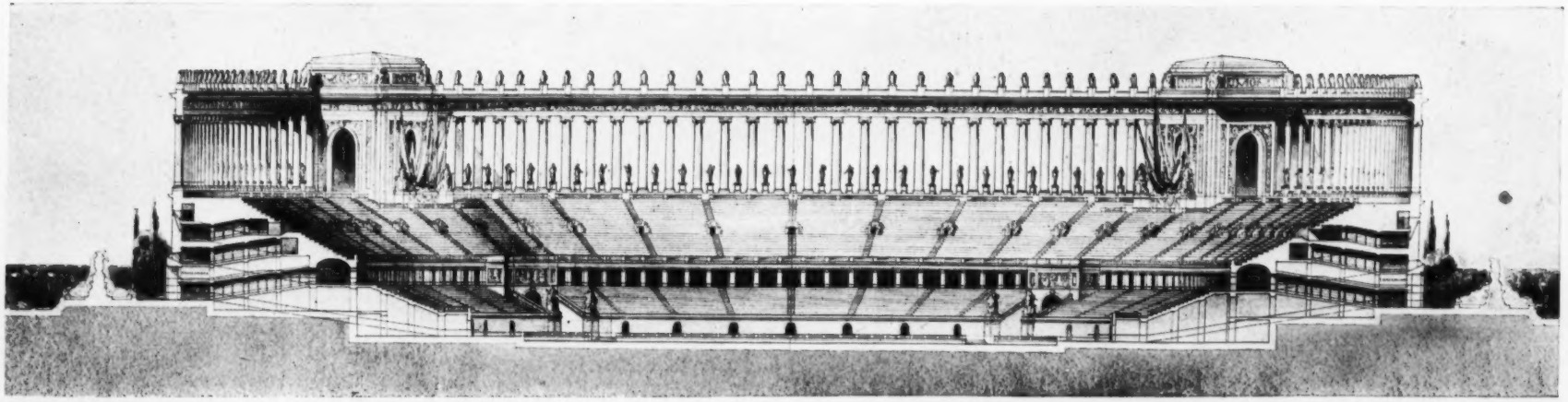
PLANS AT ELEVATIONS A., B. AND C.

COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

MARSHALL & FOX, *ARCHITECTS*



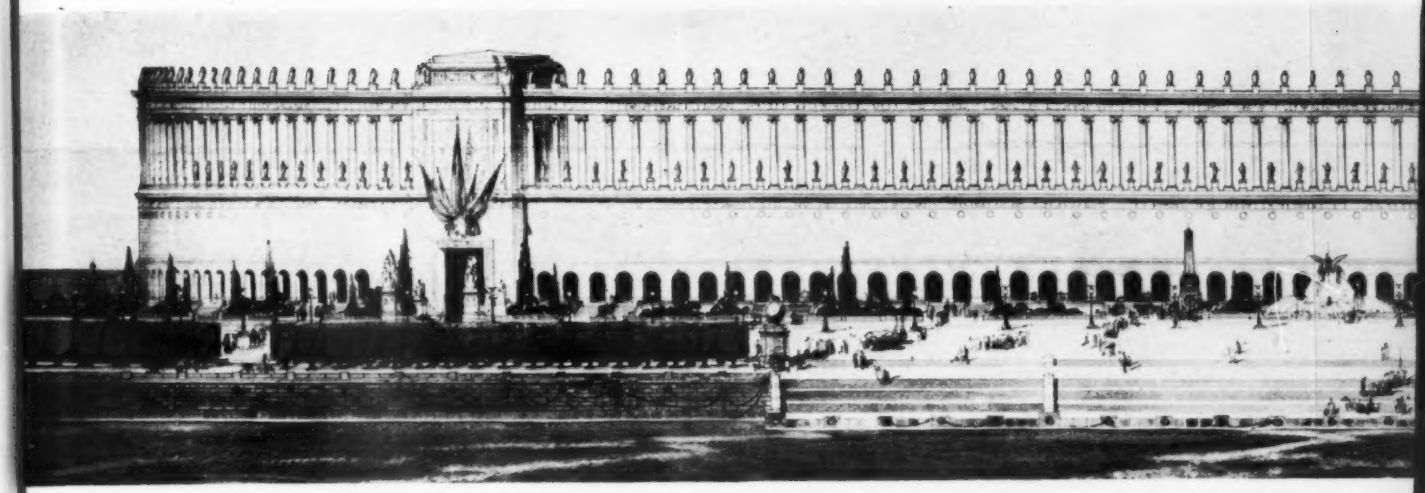
SOUTH ELEVATION



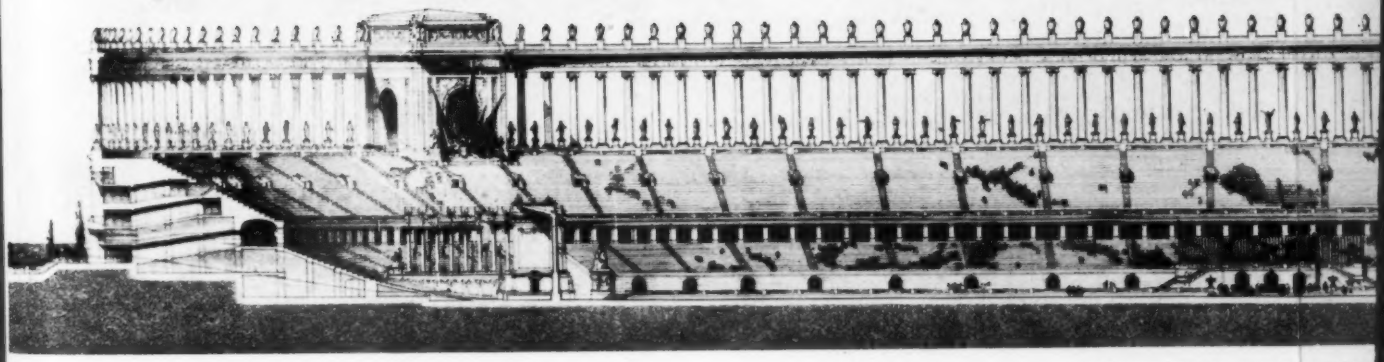
TRANSVERSE SECTION LOOKING NORTH

COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

MARSHALL & FOX, *ARCHITECTS*



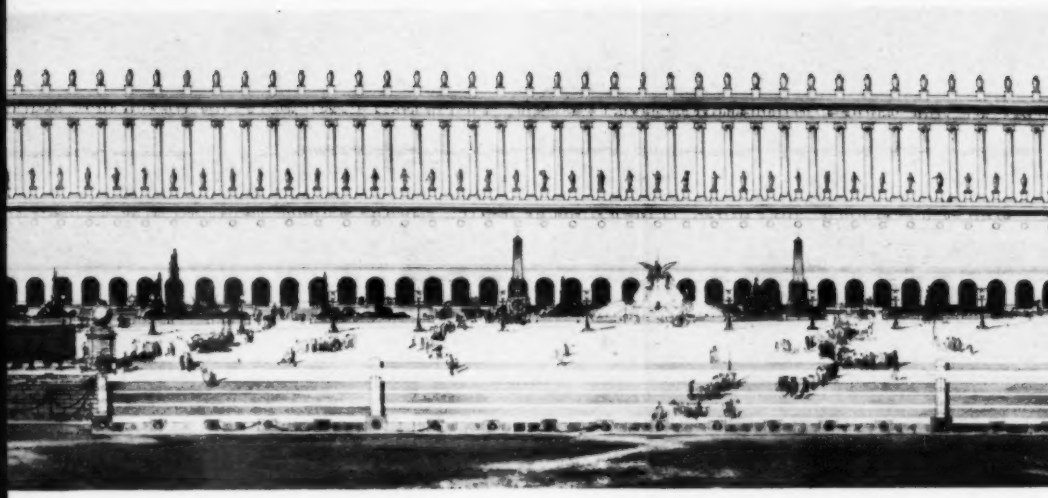
EAST ELEVATION



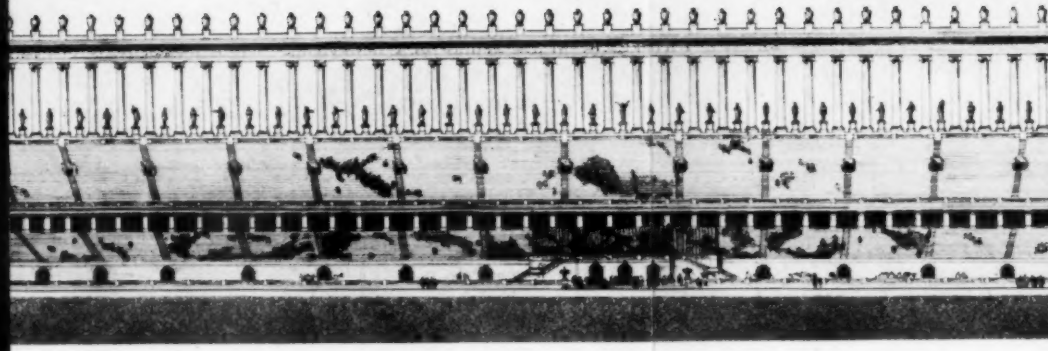
LONGITUDINAL SECTION LOOK

COMPETITION FOR A STADIUM ON THE

MARSHALL & FOX, *ARCHI*



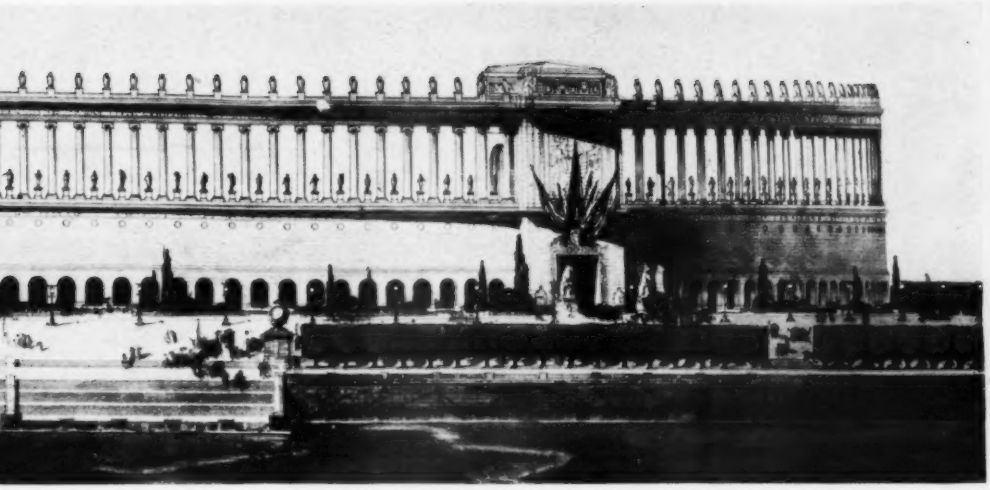
EAST ELEVATION

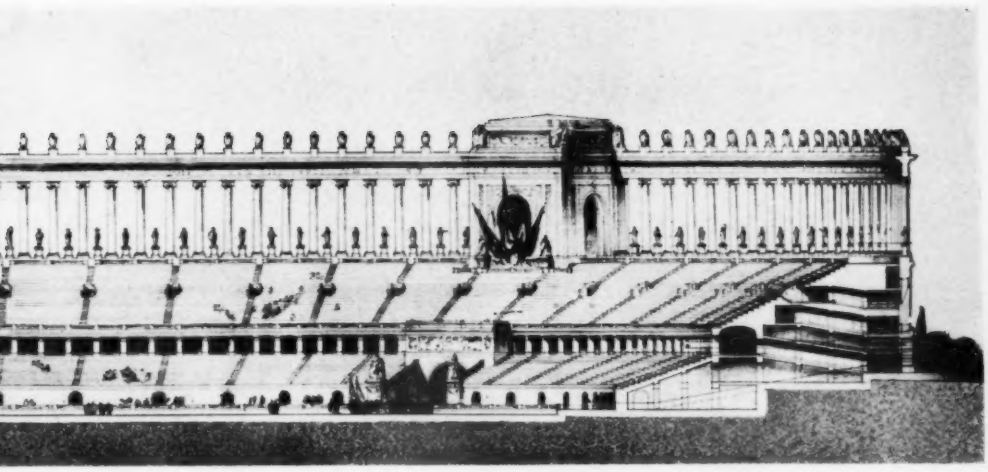


LONGITUDINAL SECTION LOOKING WEST

COMPETITION FOR A STADIUM ON THE LAKE FRONT, CHICAGO

MARSHALL & FOX, *ARCHITECTS*





CAGO

Current News

Happenings and Comment in the Fields of Architecture and the Allied Arts

In order to supply our readers with material of current interest, the news and comment appearing in issues of THE AMERICAN ARCHITECT delayed by the printers' strike will be as of actual rather than stated date of publication.

Architects May Reduce Rates to Encourage Good Building

In an effort to assist in the housing movement, and at the same time educate the home seeker in the selection of the best type of house, the directors of the New Jersey Society of Architects considered at a meeting this week the proposition of furnishing plans and designs at special and reasonable rates. The idea involves the preparation by registered architects of about fifty designs to be arranged in a portfolio which will be accessible to all applicants. Upon selection of a particular design, the name of the architect will be furnished and he will be expected to prepare the working drawings at a reasonable charge. Action on the matter was deferred.

Indorsement by the society was sought by advocates of the organization of a union of technical men in the profession, other than employers. The subject was discussed and laid over for further consideration.

Work on Cathedral Again Postponed

A total of $300,000 has been contributed toward the construction of the nave of the Cathedral of St. John the Divine in New York, it is learned from Bishop Charles S. Burch, but he and the trustees have decided its construction shall not begin for another year unless $200,000 is contributed within thirty days.

At a meeting of the trustees the question of whether the trustees would be justified, with the amount on hand, in resuming construction in advance of the campaign for funds, thereby saving a building season, was discussed, a statement said, but "it was decided that the work could not be organized on an economical basis for less than $500,000 for this building season."

The statement continued: "Unless an additional $200,000 is secured within the next thirty days there can be no construction in 1920, and the chance to gain a year in building will be lost." The foundation for the nave, at a cost of $100,000 was completed before the death of Bishop David H. Greer.

The Rev. William H. Owen, rector of Trinity Episcopal Church, Mount Vernon, N. Y., was elected a trustee of the cathedral.

Exhibition of Fine Arts of Greece

The art exhibition sent to New York by the Greek Government to make better known here the beauties and enterprise of modern Greece as well as the glories of ancient Greece, is now in progress at the Grand Central Palace, New York.

The several hundred guests were received by George Roussos, Greek Minister to the United States. Officials of the Government of Greece were on hand to give information to the guests. The exhibition, the greater part of which consisted of art photographs by Frederick Boissonnas, was shown in Boeotian Hall in Paris last summer while the Peace Conference was in session. There at least 50,000 people saw the display.

People who know of Greece from books only are likely to think of it as a great ancient country now of little importance, a country of ruins. It was to counteract this impression that the Greek Government, at the instance of Premier Venizelos, caused this exhibition. During March the exposition will be open daily, including Sunday. It will last only a month.

The ancient Greece of heroic days is skilfully blended with the modern country by the cunning camera of the artist, who spent several years in the task. He has been particularly successful with the temples of the country. Those who have never seen Greece were amazed yesterday at the beauty and splendor revealed by the art photographs. There were also beautiful modern reproductions of swords, daggers, pottery, statuary and wall paintings as well as lace work and embroidery of the present day. A vivid idea of Greece present and past may be had by inspecting the art display in the galleries.

The exposition is held under the auspices of the American Hellenic Society of this city, of which Dr. Nicholas Murray Butler is president. This organization, which has the welfare of Greece and the maintenance of friendly relations between this country and Greece at heart, numbers among its members and officers such men as Elihu Root, Charles W. Eliot, Jacob Gould Schurman, Frederic R. Coudert, Thomas W. Lamont, W. Fellowes Morgan and George M. Whicher.

Age-Old Building Material

What is pise? The word, which in its complete form is written pise de terre, betrays a French origin and, from its general appearance might well suggest some affinity with the world of art. These preliminary impressions, however, will be found misleading. There is nothing peculiarly French in pise dwellings, though they are common enough in some parts of France, and reference to them abounds in French literature of the eighteenth century.

The word itself, traced to its Latin origin, apparently means nothing more artistic than "battered." Perhaps the simplest definition of pise is provided by Pliny the Elder, who calls it "earth battered between boards," meaning by boards a form such as may be used for concrete in construction work.

The Roman sage adds that it was an old and well-tried system of building and remarks that Hannibal used this material for watch towers on the tops of hills in Spain during his campaign.

Who knows whether it was not also in use when Cheops built his Great Pyramid; for there are prehistoric pise buildings in New Mexico and Arizona which, some say, date back almost to that period?

Certainly history cannot trace the system to its origin, and the pise dwellings now visible in France, Spain, America, the British colonies and elsewhere may give no complete indication of the extent to which this material was employed in other centuries.

A Sculptor's War Loss in Germany

Hendrik Christian Anderson, the American sculptor at Rome, has just filed with the State Department at Washington and the Reparations Commission at Paris a claim of $300,000 against Germany for the destruction of a group of statues during the war.

Just preceding the outbreak of hostilities in 1914, Anderson, at the request of the German government, sent to the International Art Exhibition at Leipsig a group of bronze statues making up a large sculptural work to be known as The Fountain of Life.

The statues represented fifteen years of work and were designed by Anderson as one of the principal monuments for the international city that is to become the administrative center of the League of Nations.

The group was awarded the first prize at the Leipsig exhibition. The outbreak of hostilities and the closing of the frontier in 1914 rendered it impossible for Anderson to have the group of bronzes returned to his studio at Rome, and nothing was ever learned of their fate or disposition, until a few weeks ago, that they had been seized by the German war minister and destroyed. The huge amount of bronze and copper in their composition was presumably used for war munitions. Valuable as this was, it was still nothing from Anderson's point of view as compared with the fifteen years of work and artistic effort which they represented.

According to the information which has just reached Anderson, the Germans endeavored to seize the group of bronzes almost with the outbreak of hostilities. As America was still a neutral country, it was for the time being deferred. As soon, however, as America entered the war the group was seized and rushed to the melting pot.

The group included, among other things, a central equestrian statue and a series of small child statues representing the progress and development of life.

The Negro and Americanization

An interesting and thoughtful letter has been written to the Philadelphia *Ledger* by William Pickens of Baltimore. He writes:

We hear so much in these days about Americanization, in conferences, schools, social programs and committees, that it is about time to stop and consider what it is to be American or Americanized. We hear much of teaching English and standards of living, systems of politics and government. These things are important, but they are not all there is to being an American; they are not the most fundamental elements of the American genius. For example, they speak English in Canada, in England and in some guise in the union of South Africa and in Georgia and Texas. But neither the union of South Africa, nor Georgia, nor Texas has anything like the American spirit.

The American spirit is, first of all, a spirit of liberty. It necessarily involves a spirit of equality and of brotherhood. It is not a shallow matter of getting married and being brothers-in-law. A pure-blooded Mongolian can be "American." A white man can be "American." It is not a color; it is a spirit.

We claim, therefore, that the most vital need in the country is to Americanize thoroughly our native-born. We must Americanize the laws and legislatures of the South. If we are ever to Americanize the foreign-born we must have something to do it with, and that something must be the native product. Those who come to us will tend to become what we are. Have we ever reflected that perhaps our failure to make the immigrant an American is due first of all to our failure in being American?

It happens to be that the negro is the most American group in the country, both in ancestry and in point of attitude of mind. His line reaches much further back than that of the average white man of the country. In spirit he is less arrogant, more liberal and democratic, and believes more sincerely that "all men are born free and equal." He does not believe that he is naturally entitled to more privileges than other breeds of men. That is of the very essence of the spirit that made America. The negro does not lynch, and does not act by virtue of the mob, except in self-defense against white mobs. He wants the case tried in court. He wants law and order to be supreme and as a group he does not ask any artificial advantage of any other group. That is of the essence of America.

The intelligent negro is therefore puzzled when he hears anybody talking about Americanizing the negro. He knows that the battle would be over if only we could Americanize the white man.

Organization as Need in Housing

Industrial corporations or community organizations must solve the housing problem in the United States, according to speakers before the Massachusetts Chamber of Commerce at a housing conference held in the City Club this week. Individual initiative, it was pointed out, had been unable to solve this problem, which had become so serious in places as to menace industry.

William M. Ham, manager of the Bridgeport, Conn., development, which was promoted by that city and by the United States Government, laid stress upon the necessity for organization in attacking the housing question, and upon the desirability of "liquid ownership" of homes, so that larger quarters could be obtained as the size of a family increased. Small apartments, he thought, should not be permanently owned.

The organization in New England, which has to do with the building of homes, Mr. Ham said, is not much better than organization here of agriculture; "houses are produced largely by accident and not by plan."

Virginia Accepts Gift of Rare Paintings

Notification was sent to Judge John Barton Payne of Chicago that the State of Virginia by act of the General Assembly, accepted the paintings offered by him, which are valued at $1,000,000.

The list includes a Murillo, Reubens, a Reynolds and forty other works. The collection is expected to be housed in the Confederate Memorial Institute. Judge Payne, a native of Virginia, has just been chosen by President Wilson as Secretary of the Interior, to succeed Mr. Lane.

Swedish-American Paintings and Sculpture to Be Shown in Sweden

An unusual incentive for Swedish-American artists and sculptors to enter specimens of their work in the ninth annual art exhibition of the Svenska Kluhben of Chicago, which opens March 27 and continues until April 4, lies in the fact that the larger part of this year's exhibit is to become permanent and after further exhibition in New York will be taken abroad by the Swedish Choral Club on its forthcoming tour of Sweden. The exhibition is to be sent under the auspices of the American-Scandinavian foundation and will include original works in oil, water color and sculpture by living Swedish-American artists.

The local exhibition will be held at the Svenska Klubben, 1258 North LaSalle Street. Pictures and objects of art exhibited at any time during the last ten years will be eligible for the overseas exhibition and will be shown locally at the conclusion of this year's regular art show when a special jury to pass on all objects sent in will select those entries considered most representative of the best in transplanted Swedish art. Only objects that have never before been exhibited are eligible to competition in the local exhibition.

England Dealing With Housing Shortage

From Manchester, England, comes a new proposal for solving the acute housing shortage there. Manchester needs 20,000 workers' homes at once, and 50,000 within a short time. Private enterprise there, as here, has failed to provide the houses. The bricklayers' organization of Manchester has secured the co-operation of all the other labor organizations engaged in house building and has proposed to the Manchester Council that the workers be given the contract to build 2,000 houses as an experiment. They believe that, working under their own leaders, responsible legally and financially for the output, and with the "team work" engendered by the knowledge that the profits on the project will go to the workers they can do more and better work than would otherwise be the case. The Manchester Council has accepted the offer and awaits formal approval from the British Government. If the experiment succeeds, the workers in the building trades industries propose to expand their committees into a national guild, which shall build houses all over England. It is an experiment that is worth watching.

Better Farm Houses Being Erected

George Washburn, architect, of Burlington, Ia., calls attention to the fact that a large number of farm houses are planned for construction in that section. There was a time, he says, when the farmer wanted the cheapest thing in the building line that could be furnished. Now it is different. The farmer has discovered that the best is the cheapest, and as he is no longer compelled to count the nickels and pennies, he gets the best. That applies to machinery and clothes and everything that he needs, as well as to houses. He wants all the modern improvements that he can get and he will find that is the kind of a house that will give him satisfaction in the long run.

"There has been much talk of the 'back to the soil movement,'" said Mr. Washburn, "and there is much good in it. At least in the intention. But what is much better than inducing people to go back to the farm who have fared well in town or getting people to go out on the farms who know nothing whatever of farming, is to make conditions so pleasant on the farm that the young people will not dream of moving to town and forsaking the farm. When they have rooms in a modern farm home and have everything in that home that they can enjoy in the city, they will not be tempted to move into a hall-bedroom in town, where there is scarcely room to turn around. It is better in every way to keep the people on the farm who know farming than to let them get away to town and then to replace them by other people who know little or nothing about farming.

"Between the modern farm home and the auto, the man in the country and the young people growing up on the farms have everything that the city folks have and some things that the city folks have not."

Alabama Architects Elect Officials

A Birmingham architect, Hugh Martin, was elected president of the state chapter of the American Institute of Architecture at its meeting at Auburn. Other officials were chosen as follows:

George Rogers, Mobile, vice-president; Eugene H. Knight, Birmingham, secretary and treasurer. Frederick Ausfeld, of Montgomery, is the retiring president.

The meeting was held at Auburn in connection with a meeting of the department of architecture at Auburn. W. T. Warren, of Birmingham, an alumnus of Auburn and of Columbia delivered an address to the student body in the afternoon.

Edwin B. Lancaster, Auburn student, won the prize this year for the best design and plans for a building submitted in the annual contest. Mrs. C. C. Thach, wife of President Thach, entertained the visiting architects with a luncheon at her home.

W. M. King, of the firm of Wheelock & King, of Birmingham, was elected a member.

The aims and objects of the Alabama Art League were indorsed by the state chapter and also the national associations of arts in co-operation with the government in meeting the housing problem.

Competition for a Cover Design

The Architectural Exhibition Committee, of which Frederick M. Hodgdon, Corn Exchange Bank Building, Chicago, is chairman, invites all architects, artists and draftsmen to enter a competition for a cover design for the catalog of the Thirty-third Chicago Architectural Exhibition. The premiated design will receive $100, the design placed second $25. Competition closes at 5 p. m., Monday, March 22.

Program: The Architectural Exhibition Committee is desirous of obtaining a design of merit for the cover of its catalog. The size of the cover will be 7½ x 10½ inches, but the size of the drawing must be twice that size or 15 x 21 inches. Not more than two colors can be used in the design besides the natural color of the paper. The design must incorporate the following lettering:

Thirty-third Annual Chicago Architectural Exhibition,
April 6 to May 5, 1920, Art Institute

arranged as the designer sees fit. The design will also be used for poster purposes. Other than the above conditions, the designer will be unrestricted. Drawings are not to be signed or marked in any way.

Delivery of Drawings: The drawing is to be inclosed between stiff cardboards or rolled in a strong tube securely wrapped and addressed to Frederick M. Hodgdon, chairman of the Architectural Exhibition, Room 1614, Corn Exchange Bank Building, on or before March 22, 1920. Drawings not delivered before the time set will positively not be considered. In the wrapper with the drawings is to be inclosed a sealed blank envelope, containing the name of the contestant.

Drawings submitted in this competition are at owners' risk, but reasonable care will be exercised in the handling and keeping.

Jury of Award: Ira Hoover, Allen Philbrick, Hugh M. G. Garden, Emery B. Jackson and J. A. Kane, well known to the profession, have accepted invitations to serve on the jury. The judgment will take place March 23, 1920. The prize and mention designs will be entered in the coming exhibition. Unsuccessful designs will be returned to their authors.

Academy in Rome Asks Funds

The American Academy in Rome has announced that it would celebrate its twenty-fifth anniversary by seeking a $1,000,000 endowment fund. It is planned to devote $450,000 of this fund to general endowment, $150 to $150,000 to landscape architecture, $150,000 to the furtherance of classical studies, $150,000 to musical composition and $100,000 to the accommodation of women—a new departure.

The Academy in Rome still owes the late J. P. Morgan $166,540 of an original debt of $375,000, which Mr. Morgan agreed to cancel dollar for dollar with new subscriptions. It is hoped new subscriptions will be received to wipe out that liability before May 1.

Personal

F. C. Thornley & Co., Inc., constructing and consulting engineers, announce the opening of their offices at 31 West Forty-third Street, New York.

The firm of Nolan & Torre, architects, with offices in the Hennen Building, New Orleans, have recently opened a branch office in Jennings, La., with Sedgwick Moss.

Fred B. O'Connor, who has been with the Architectural Department of New York State as special designer for fifteen years, has resigned to become chief draftsman and office manager for Russell & King, architects, of Syracuse.

C. Frank Jobson announces that Bert C. Hubbard, who has been connected with him for seventeen years past, now joins him in the practice of architecture under the name of Jobson & Hubbard, 706 Pullman Building, Chicago.

Vance W. Torbert, formerly with Carrere & Hastings, announces that having been discharged from his commission as Captain in the Construction Division of the Army, he has opened an office for the general practice of architecture at 200 Fifth Avenue, New York.

W. Elliott Dunwody, Jr., and William F. Oliphant, Macon architects, announce the formation of the firm of Dunwody & Oliphant, architects, with offices in the Jaques Building, Macon, Ga. A. Sidney Brown is also identified with the new firm as associate architect. Mr. Dunwody was formerly of Nisbet & Dunwody, well-known Macon architects.

News from Various Sources

The new plant of the Youngstown Steel Car Co., at Niles, Ohio, is scheduled to be placed in operation in April.

* * *

SYDNEY:—The Federal Government is advancing sums aggregating $45,000,000 to the New South Wales Government for repatriation purposes.

* * *

The Republican Steering Committee of the House at Washington voted to oppose any appropriations for public buildings or grounds during the present session of Congress.

* * *

The Carnegie Steel Company has appropriated over $1,500,000 with which to build 250 houses for its employees and a modern community house at the new steel plant at McDonald, Ohio.

* * *

ROME.—Zocchi's colossal statue of Columbus, weighing 600 tons, will be taken to Buenos Aires on Italian steamers free of charge, under a permit granted by Premier Nitti. Requests for the transportation of the statue to Argentina were supported by Dr. Gino Persico, former Italian vice-consul at Buenos Aires.

* * *

Grunewald Villa, in an exclusive suburb of Berlin, has been bought by Americans, according to the *Tageblatt*. The property belongs to the late Robert von Mendelssohn, a banker. The price is said to have been 4,000,000 marks. One report has it that the premises will be the permanent residence of the American Ambassador.

* * *

People who have traveled about the country a great deal say that immense numbers of box cars are standing on the side tracks, all of them out of repair. One of the troubles of the transportation situation dates back to last summer, when the shopmen struck. Scarcity of labor and bad weather have prevented the companies from doing much repair work on the tracks.

* * *

A special mission from southern Russia, headed by the Under Secretary of the Interior, P. P. Gronsky, will start for America soon to establish political relations with the United States. The mission will also take up the work of re-establishing economic relations between southern Russia and America. The members will be specialists in economic, political and military questions.

* * *

The expenditures during 1918 for governmental costs in the 227 cities in the United States of 30,000 population aggregated $1,172,695,829. The average per capita expenditures, including interest and outlays, amounted to $34.16; and for all governmental costs, including interest but excluding outlays, the average per capita payments were $26.05.

* * *

Officers of the United States Marine Corps at Port au Prince, Haiti, have issued special orders to keep the natives from breaking into their model jail. Recently a check roll call of prisoners showed an excess of five over the number regularly committed there by law. Investigation showed that the five had sneaked in with a returning road gang, lured by the prospect of three good meals a day and a comfortable cell in which to sleep. Now every party of prisoners working outside the walls is carefully counted before it is admitted.

Weekly Review of Construction Field

Comment on General Condition of Economics with Reports of Special Correspondents in Prominent Regional Centers

During the past week the stronger expression of opinion has come from the conservative element in the building trades. There is good sense in their disparagement of the rough and tumble scramble for contracts which cannot possibly be got under way and for materials which do not yet exist. There is no doubt but that an anticipation of needs has had its influence in bringing prices to their present levels. But as these anticipated needs are realized, which is undoubtedly what is going to happen, the prices will remain where they are. Some contracts may be cancelled because of excessive costs, as they were cancelled last year, but even a most generous allowance for such cancellations cannot support the belief that the markets are to be flooded with building material. The contracts already placed will keep abreast of whatever supply may be expected.

Steel

The prospects of an increased steel production have further improved. Transportation conditions are better. The amount of finished steel at the mills has decreased and the railroad officials are now promising additional cars. If it becomes necessary, they say, stock cars are going to be used, which serves to show the sincerity of their intention.

Coke production has increased by 12,000 tons in the Connellsville region.

In Youngstown, however, the production fell off to some extent owing to a shortage of coal. The finishing departments of three steel producers were compelled to close down to a certain extent for two or three days.

The monthly report of *The Iron Age* indicates February's gain in pig-iron production shows a gain over the previous two months. The net gain over the December output was 23 per cent.

It is stated that the Supreme Court decision in the United States Steel Corporation case is not likely to have any effect upon the corporation's price and sales policies, inasmuch as these policies are encouraged largely by banking interests whose conservative attitude is well known. It seems to be more and more accepted in the trade that these policies are to be vindicated. In fact, similar policies are being adopted in other fields.

Stabilizing the Cost of Materials

The Wells Brothers' Construction Co. has expressed the opinion that "We may see the wholesale cancellation of contracts for construction which cannot return dividends under present inflated prices. Should such wholesale cancellations occur, we might find no shortage of the basic materials. Yet outstanding contracts for materials to be used on work now going on would still be priced at fictitious values. . . . There was never a greater need for legitimate building, but we shall not get the really essential building done if we attempt to carry on a "paper program" which inflates prices to the point where the home builder and the manufacturer of fairly priced basic necessities are squeezed out of the market."

A Chicago lumber firm is circularizing the trade, notifying its customers that the price of lumber will not be advanced for at least six months, and that all lumber will be sold at the present price level. If it is possible they intend to reduce prices. It is said that other lumber dealers have approved this idea and will also put it into effect. "The next thing," says the head of this company, "is to bring about a condition of coherence in the building trades so that the home builder may enter into contracts for homes with some idea of stability. Only through this stabilization of the material and also of the labor market will it be possible to build the thousands of homes necessary."

Building Production

Superintendent Martin of the Tenement House Department of the Bronx, New York City, states in the New York *Times* that during the first two months of this year plans were filed for ten buildings as against plans for four buildings filed during the same period of last year. But Mr. Martin says that even the unprecedented rentals now being obtained on new buildings are not encouraging builders to go ahead. The building costs, in which high labor prices are no inconsiderable factor, have risen 300 per cent in the last ten years. This will not be a building year, he thinks. It will certainly not be a year in which building construction approaches a fulfillment of the demand, for a survey of that particular district states that apartments are needed for 8,000 families.

After making allowance for the reduction in the purchasing value of the dollar, we shall find that we still have under way a building construction boom which is 40 per cent in excess of anything previously known. The likelihood of this quantity of building being accomplished, however, rests largely upon the ability of those who supply building materials to meet with the demand. To a greater or less extent the disadvantages and difficulties of the past year will persist. The transportation system will probably be improved but we cannot hope for the efficiency of ante-bellum years. The inefficiency and insufficiency of labor must be felt as an impediment even with the most favorable intentions displayed.

The Aberthaw Construction Co. warns "not against undertaking building in general but only against undertaking certain kinds of it." It is their opinion "The big uncomplicated industrial operations will be carried through close to schedule wherever they are intrusted to organization with the capital, the mechanical apparatus and the human organization capable of large scale procedure. If the number of units to be constructed could be materially reduced in number and proportionately increased in size, it is a fair assumption that an expansion of 41 per cent in volume could be made.

"The work that will lag is small scale construction which requires special materials in unusual sizes, instead of standardized design throughout and which, further, because of the necessity for meeting various architectural requirements calls for unusually skilled and conscientious workmanship at all points.

"Therefore, the owner contemplating a big project should be encouraged to go ahead with it; the one with a small one should be counseled to caution and delay, unless he knows himself to be in complete control of all the elements essential to a successful outcome."

Legislation

The Real Estate Board of New York says that in view of the exceedingly grave housing shortage some legisla-

tion should be enacted which would help to relieve this shortage; that the most direct and practical way to get this is to pass a bill exempting from the provision of the income tax law the interest on mortgages secured by real estate.

It seems plain that real estate mortgages, the interest of which is taxed, cannot compete with tax-free securities to which funds are naturally attracted; and that this will operate seriously against the production of new housing.

The New York State Legislature has various bills pending which intend to deal with the evil of rent profiteering. One provides that a monthly tenant may not be evicted unless notice is served upon him sixty days before the expiration of his term. Another prohibits proceedings to recover possession of real property for non-payment of rent unless the rent sued for shall be reasonable. A third provides that no monthly tenant shall be removed from any building on the ground that it is to be reconstructed, unless ninety days' notice has been given. A fourth is to limit rentals to 10 per cent of the actual value of the house and lot plus necessary and actual expenses.

The Mayor of New York City and the Speaker of the State Legislature are expressing much interest in rent profiteering. Speaker Sweet said in a letter to Committee Chairmen: "I believe this matter one of the most serious questions confronting us. I appreciate the constitutional difficulties that arise in dealing with the subject involving the right of contract, but I believe this situation can be overcome by appropriate legislation."

A bill has been introduced in Congress for the establishment of a system of home loan banks, similar in plan to the Farm Loan Banks, which also includes a tax exemption feature. Another bill proposes that building loan associations shall be authorized to issue bonds secured by deposits of their real estate mortgages and thus make the assets of such associations more easily available for further loans.

February Building Operations

The statistics of building operations published by the F. W. Dodge Co. show in the districts of New York and northern New Jersey, Pittsburgh, and the Northwest (Minnesota, North and South Dakota) a falling off of February as compared with January in the number of building contracts awarded. New England, Philadelphia, Baltimore and Washington, and the Central West continue to show advances, though not very radical ones.

The total amount of contracts awarded during February in the territory east of the Missouri and north of the Ohio rivers was $216,663,000—as compared with $235,848,000 for January. Of the February total 42 per cent was for industrial building, 20 per cent for business buildings, 20 per cent for public work and utilities and 17 per cent for residential buildings.

Although the building figures for 1919 show a substantial increase in values over previous years, Babson's Statistical Index points out that, making allowances for the increase in building costs, including labor, which have risen on an average of 80 to 90 per cent since 1914, the actual volume of building for December, 1919, amounts to about the same as in December, 1912, or December, 1913.

For the past eleven years the annual building figures for 120 identical cities are as follows:

1909	$888,114,741
1910	846,991,622
1911	824,147,884
1912	879,094,308
1913	814,509,360
1914	728,801,072
1915	763,343,811
1916	919,435,203
1917	633,483,313
1918	372,793,978
1919	1,170,773,197

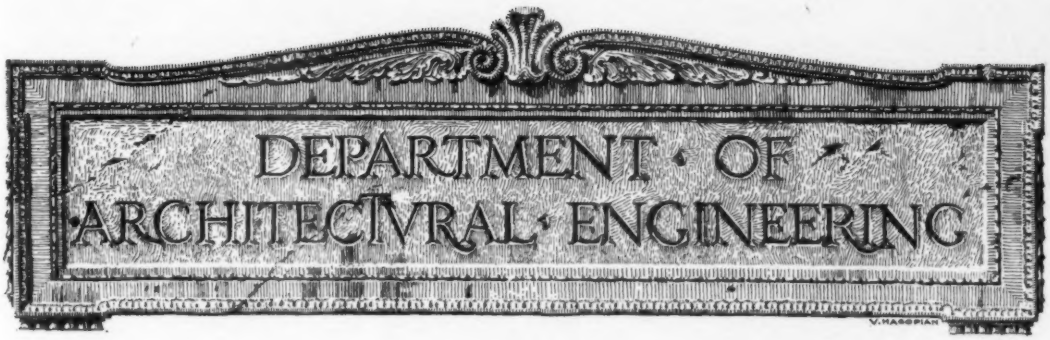
(Special Correspondence to the American Architect)

San Francisco.—In addition to a large amount of construction work under way in the commercial sections of San Francisco, nearly all of the desirable residential tracts are in the process of extensive development. Costs of labor and material do not seem to have produced any slowing up of the general building activity, for all types of structures are badly needed in the West. Housing facilities are still under par and it is expected that it will be some time before normal conditions are again reached.

Realty firms of the larger class are handling many construction contracts through their offices and the loan associations are taking care of a considerable amount of building money. The public is being acquainted with the fact that these firms are willing to promote business of this sort. Through this method of circulation as well as through individual channels, money is plentiful in the building market.

Permits show an unusual amount of construction work for the winter months. Extremely light rainfall has permitted building to go on practically without interruption, so it is probable that a good deal of work will be carried through to completion earlier than was at first figured upon.

The automobile section of San Francisco is expanding rapidly. A number of high-class sales buildings have gone up lately and several other large jobs are in contemplation, in addition to many buildings of the garage and repair-shop type, which are being erected all over the city.



Fire Protection for Schools

Part II—Causes of Fire, Its Prevention and Extinguishment

By H. W. Forster.

THE records of the Actuarial Bureau of the National Board of Fire Underwriters show the principal causes of fires in schools to be lightning, stoves and furnaces, chimneys, matches and smoking, and spontaneous combustion in various materials. The order here set forth does not necessarily indicate the jeopardy to life or the relative amount of property destroyed.

The ordinary grammar school or recitation building, containing only class-rooms and a basement with heating equipment and storage rooms, has fire hazards limited largely to heating and lighting systems and to poor housekeeping. The more modern schools, and especially high schools and trade schools, contain the hazard created by the use of power-operated machinery, combustible working materials, inflammable liquids, chemical laboratories, etc., thus showing an increase.

In the following sub-divisions the causes of fire, insofar as they are pertinent to the work of the architect are stated, as well as the methods by which the fire hazard may be reduced.

Lockers.—The modern tendency is to provide central locker rooms with metal lockers in the place of the old wardrobe and hall lockers. New lockers, no matter where located, should be of metal and have solid backs and side partitions to prevent spread of fire bteween them. Screen or punched plate doors are preferable to admit of inspection without unlocking.

Electricity.—The insurance interests report that in 1916, 86 fires from electrical causes resulted in a loss of $585,054. In 1917 the number of fires was 70, with a property loss of $500,307. Electrical fires are therefore a very definite hazard in schools. The National Electrical Code as issued by the National Board of Fire Underwriters contains specifications covering every detail of electrical installation, and compliance with these specifications will eliminate practically all fire hazard in connection with electrical equipment.

In grammar schools the electrical equipment consists mainly of wiring, lamps, switches and fuses. In the larger schools, however, especially in high schools and technical schools, the hazard is increased by the installation of rheostats, motors and various types of electrical heating devices. Some of the larger schools even operate generating systems. Only the most common electrical hazards are discussed herein.

Electric wiring should preferably be installed in conduit throughout. Where open wiring is used there is always the possibility of mechanical or other injury.

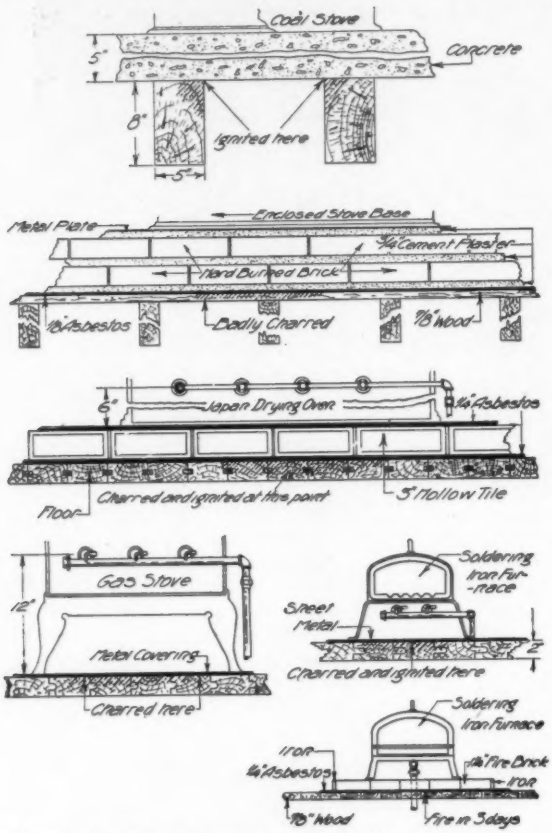
The insulation on twisted pair cords deteriorates very quickly, and when in contact with metal there is danger of a short circuit which will start a fire. Portable cords should be used sparingly and should be of the heavy reinforced type with a strong guard for the lamp.

The ordinary incandescent lamp gives off heat enough to be a serious fire menace. Wherever there is danger of lamps coming in contact with combustible material or being broken, they should be inclosed in substantial wire guards securely clamped to the lamp socket.

Combustible shades, often of paper or cardboard and sometimes even of celluloid, are found on pendant lamps, especially where these are used about machines. Where shades are necessary they should be of metal.

Heating units, such as flatirons, hot plates, glue

heaters and occasionally stoves, found in domestic science and manual training departments, should receive special attention, as they have a bad fire record. A red pilot light should be installed in the circuit with each heating unit, or connected series of units, to serve as a danger signal whenever the current is turned on. Metal or asbestos stands



Courtesy Crosby-Fiske-Forster Handbook of Fire Protection.

FIG. 1. FIRES DUE TO IMPROPER INSTALLATION OF HEATING DEVICES. TO MANY ANY OF THESE SIX INSTALLATIONS WOULD HAVE APPEARED PERFECTLY SAFE

should be provided for irons, and proper air space should be maintained about all heating units.

Fuses are the safety valves of the electrical system and should be installed at the point where the wires enter the building and on each branch circuit. Open link fuses are still used in some of the old schools, and frequently cases are found where janitors or teachers have replaced blown fuses with copper wire, nails or any other conducting material that happened to be handy. Such conditions subject the entire circuit to possible overloading have caused many fires.

Stereopticon lanterns generally require too much current to admit of their being installed on an ordinary lighting circuit. Where they are used it is therefore generally necessary to provide special connections.

Gas Lighting and Heating.—The essential features to secure safety from gas lighting, other than care in handling matches, are:

(a) Proper clearance over mantles and burners. Three feet is ordinarily necessary with a Welsbach mantle and two feet with a flat flame burner. Lesser distances than this require heat bells.

(b) No swinging brackets where flames can come into contact with any combustible material.

(c) Wire guards for flames to prevent people and materials from coming in contact with them.

(d) Elimination of key control for gas lights where pupils might play with them.

Lightning.—In 1916 lightning started 376 schoolhouse fires in the United States, with a total loss of $61,811.00. In 1917 there was a loss of $199,789.00 as a result of 499 fires. Not a building that was struck was provided with lightning rod protection. Contrary to the common opinion, a lightning rod installation, properly designed and installed, affords decided protection for exposed buildings.

Heating Hazards.—It is amazing to note the indifference of most people to fire hazards of this type. The cutting of construction expenses by setting beams and floor joists into the brickwork of chimneys is poor economy, as witnessed by the photograph on page 293, which shows a chimney with 4-inch brick walls into which woodwork has been let.

The minimum specification for a brick chimney in a building of more than one story is 8-inch walls and a flue lining. For one-story buildings with an ordinary stove a chimney with a 4-inch wall and flue lining may be built directly on the ground. All chimneys and pipes should be thoroughly cleaned each fall before fires are started.

The hazard of cracked stoves and of poorly supported stovepipes with open joints is obvious. While stoves and furnaces should be operated in a manner to prevent overheating, they should be so located that serious overheating will not set fire to the building or nearby storage.

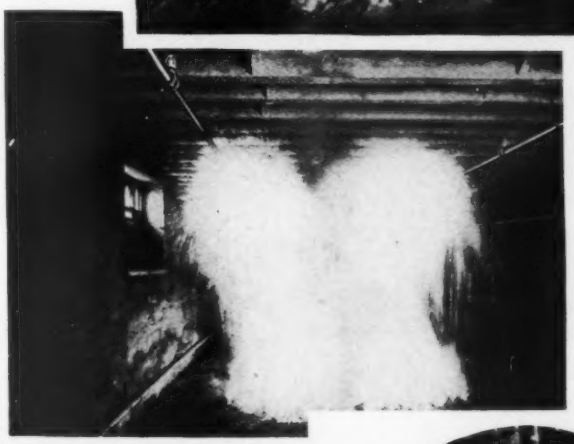
Any woodwork heated to 150° C. or over for any length of time is liable to ignite, and all heating apparatus must be installed with this fact in mind. (See Figure 1.)

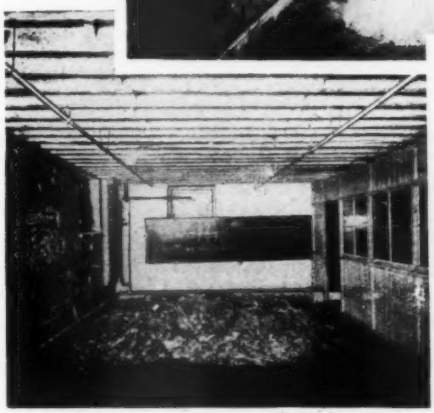
Boilers and furnaces should always rest directly

WATCHING THE WATER DISTRIBUTION

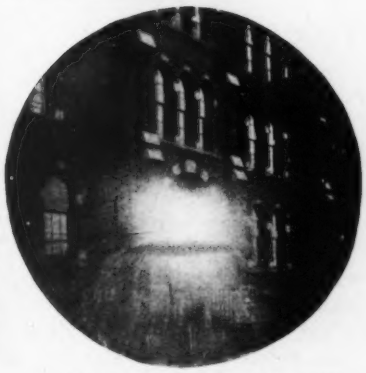
THE START OF THE FIRE

WITHIN A VERY BRIEF PERIOD AFTER THE IGNITION OF THE FIRE THE SPRINKLERS AUTOMATICALLY COMMENCE TO DISTRIBUTE THE WATER, AS HERE SHOWN.





FIRE EXTINGUISHED WITHOUT ANY HUMAN AID



HOW A SPRINKLER LOOKS IN OPERATION

ILLUSTRATIONS OF SPRINKLER OPERATION IN A CLEVELAND SCHOOL

on the ground or on absolutely incombustible construction; never on wood, even if protected.

Where stoves must be placed on combustible construction, they should be raised on legs or supporting beams at least 6 inches and preferably 12 inches from the floor, ventilation being thus afforded.

Floors should be protected over a liberal area with metal on asbestos.

Proper clearance overhead where floor above is of wood will vary with the heating device, but should not be less than 2 feet with a furnace and 3 feet with a boiler. For stovepipes the minimum clearance is generally placed at 12 inches, although 18 inches is better. Ample clearance from wooden walls and partitions is as important as adequate headroom.

In addition to the usual heating devices, schools are likely to have in them hot plates used in domestic science courses, glue heaters in woodworking shops, forges, annealing furnaces, and blow torches in blacksmith and machine shops, stoves, mangles and irons in laundries, and gas heaters at lunch counters. In connection with all of these there are fire hazards which must be guarded against.

Steam Pipes.—The possibility of fire occurring through contact of hot steam pipes with woodwork is questioned by many, but the danger has been definitely established. In the case of the Collinwood School fire, the official verdict was that a steam pipe passed through a closet near the foot of the stairs and was undoubtedly the cause of the fire which destroyed 175 lives. Proper insulation or air space should be provided about all steam pipes where they pass through floors or partitions.

Fire Extinguishing

IT is startling to see how little provision is made for fire fighting in the average school. It is even more startling to observe the poor upkeep of equipment and the ignorance of the janitors and the faculty as to its use.

For isolated country schools, especially of college type, good water supplies, fire mains, hydrants, hose, ladders and other equipment are essential for property protection purposes, but the features of such a protection system will not be discussed here, as that is an intricate engineering problem, varying greatly with the conditions. This article will be confined to the fire-fighting equipment which may go into the school building proper.

Automatic Sprinklers.—Some school boards and principals either have not understood the value of sprinklers or have been prejudiced against them, but in many of the older schools automatic sprinklers are the logical answer to the problem of securing greater life safety. Unfortunately, in many cities conditions are such that the best proposition by no means goes through, as witnessed by the notorious case of a certain city which suffered a serious loss in its schools and which invested funds, sufficient to provide adequate sprinkler protection, in an installation of stamped metal ceilings.

While the school buildings should be equipped with hand extinguishing apparatus, the ordinary school over one story high, if of combustible construction, needs automatic sprinklers, and needs them badly.

Frequently an installation of sprinklers will furnish a sufficient degree of protection to render unnecessary expensive structural changes that would otherwise be imperative in the interests of safety.

The sprinkler, if properly maintained, is on duty day and night, goes into action as soon as the fire reaches modest proportions, is not affected by smoke as are human fire fighters, and can be arranged to give an alarm the moment water flows from the sprinkler system. (See illustration on page 291.)

Sprinkler heads are made with a special solder which melts at about 160° F., which is less than the boiling point of water. The sprinkler has a ½-inch orifice or nozzle and a deflector, and under usual pressure will discharge 15 to 20 gallons of water per minute in the form of a drenching spray over an area of perhaps 15 feet in diameter. As the sprinklers are seldom placed over 10 feet apart, these spray circles overlap and a fire has little chance to burn or spread.

It is gratifying to know that a considerable number of sprinkler equipments have been installed in schools.

In cities where it is impracticable for financial reasons to install the full equipment considered desirable, the following procedure may be adopted:

(a) All school buildings which are under the jurisdiction of the board which is considering sprinkler protection should be listed in the order of their relative danger to life, taking into account construction, exits, operations carried on therein, and any other essential factors.

(b) Sprinklers should be provided in the basements of school buildings in the order of their standing on the relative hazard scale.

(c) These sprinkler systems should all be arranged so that they can later be extended to upper floors of the buildings.

(d) After basements of all buildings, except the very finest, modern, incombustible

ones, have been equipped, the installations should be extended upward, again beginning with the more hazardous on the list.

(e) In this manner a given amount of money will be used most effectively, and ultimately all combustible schools can be fully protected.

The reason for this proposal will be evident upon reflection. Fires above people seldom jeopardize their lives. If there are two ways out of a given room, a fire on the same floor is not a very serious matter, assuming that all rooms are occupied, fire promptly discovered and alarm given. On the other hand, fires below persons, and particularly fires in the basement where rapid spread has unfortunately been the general rule, are most to be feared. Practically all persons are above a basement fire, and fires spread upward far more rapidly than horizontally or downward. The Collinwood and Peabody life loss resulted from basement fires.

Inside House Prevention.—In high schools and colleges, especially where these are without public protection, there is generally advantage in an installation of inside hose, provided that there are trained persons to use the equipment to advantage.

In all schools a hose connection should be provided in the boiler or furnace room to wet down ashes and to use on incipient fires.

Chemical Extinguishers.—Approved extinguishers of the soda and acid type should be distributed throughout all school buildings. From any point in any school corridor at least two fire extinguishers of this type should be plainly visible, and they should be located not more than 100 feet apart. At least one extinguisher should be placed in each laboratory, woodworking shop, basement, or other place where there is any special hazard.

Special liquid extinguishers may be valuable in special locations for fires in oils, grease or electric equipment, as they function chiefly by the generation of a gas blanket which excludes oxygen from the flames.

RESULT OF POOR CHIMNEY CONSTRUCTION. FLOOR ATTACHED TO CHIMNEY HAVING ONLY 4-INCH WALLS AND NO LINING. FIRE DESTROYED BUILDING

(To be continued)

Foundations, Their Selection, Design and Construction

Announcing a Series of Articles

IN presenting in this department to the readers of THE AMERICAN ARCHITECT a series of articles on Foundations, their proper selection and design, it may be well to set down as preface some facts that it would appear should be taken into consideration with reference to the architects' attitude toward a certain part of his building that of late years has not always received the same careful consideration as has been given to the design and plan of the structure above the ground level.

Engineers have complained, and perhaps with some justification, that in the selection and placing of foundations—even of buildings of importance—architects have in so many instances so slighted this phase of the work as to throw the real responsibility for the stability of the structure, as far as its foundation is concerned, entirely upon other related professions.

It is necessary, if the architect is to assume his vocation as a "master builder," that he should be thoroughly conversant with every detail of his structure from the lowest part of its foundation to the part farthest above ground and that in preparing such plans and specifications as are necessary, the foundations should receive the same thoroughness of treatment as every other part of the building. Failing in this and permitting this duty to devolve wholly upon the engineer is in a measure shirking a very direct responsibility.

It is assumed that in every architectural office engaged on work of any magnitude there will be a department of architectural engineering whose duties it will be carefully to design and plan not only the foundation but many of the other architectural engineering features that develop in the structure of the modern building.

To reiterate a contention often made in these columns: the architect is the master builder of the work and he should be able either through his own knowledge or that of those employed by him in his organization to present in his final plans an accurate and well developed scheme for the foundation as for every other part of the structure. Unfortunately there are many instances in which this essential condition does not exist. It is with the purpose of presenting to the architect and architectural engineer certain elements as to Foundations that are not only vital, and therefore essential, but are really a part of the architect's duties and may not with honesty be shirked by the architect or assumed by the engineer or the contractor.

We hear much at this time of the correct inter-professional relation that should exist between the professions of architects and engineers, and it is believed that nothing would more aggravate a condition of dissatisfaction between these two professions than the fact that either one or the other was side-stepping a duty for which it was paid to perform.

It will be the endeavor of the writer of these articles, whose experience is one gained by actual practice with foundation work, to direct attention to such things as it has been his experience to observe, and to point out just what the architect should do and just what he should know and put into active practice in every building where the foundation becomes of importance. There will be presented actual descriptions of various foundation operations, the elements controlling their design, and the necessities of the building as arbitrarily commanding their planning. The first of these articles, which will appear shortly, will deal with preliminary sub-soil investigations.

Construction Division U. S. A. Still Active

The job of the Construction Division, U. S. A., is not yet over. The cantonments which were constructed were of a temporary nature and character and will not provide proper housing facilities for the permanent personnel of the regular army. There are in the United States housing facilities of a permanent and a usable nature for something less than 100,000 troops. To provide for the 300,000-odd men which seems to be the minimum proposed by new army legislation, it is necessary to provide housing facilities for some 200,000-odd men and officers. This, of course, does not consider the housing required for the annual drafts which will be brought in for temporary service under any universal training law.

The minimum expenditure that may be expected to be made by the Construction Division for construction of permanent quarters and for the operation of utilities was placed by General Marshall in his testimony before the Senate committee, at $100,000,000 a year. This figure exceeds the total amount annually spent by the whole Quartermaster Corps during the period previous to 1917. The operation of the utilities throughout the cantonments is an item of great importance, as it has been estimated that the average cost of furnishing a soldier with heat, light, water and sewerage facilities is somewhere like $144 a year, though in special cases it has dropped as low as $100. On the basis of an army of $300,000 men, this item alone is between $30,000,000 and $42,000,000.

Bibliography of Literature on Chemical and Engineering Laboratories

By CLARENCE J. WEST

DURING the war industrial research in the United States was greatly stimulated and the importance of the industrial research laboratory as a factor in maintaining the supremacy of an industry was more clearly recognized than ever before. As a result of this, new laboratories will undoubtedly be built and many old ones will be reorganized that they may render more efficient service.

In order that the experience of others may be available to those who are contemplating the establishment or the reorganization of their laboratories, the following list of references has been collected. With a few exceptions, only those laboratories have been included, the description of which is accompanied by drawings, plans or photographs showing the general arrangement of the buildings or rooms. A few general references on the value of Industrial Research are also given.

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Engineering News from Europe

Reconstruction of France

There is to be a permanent exhibition at Paris (rue Louis-le-Grand), known as the "Renaissance des Cités." The aim of the promoters is to show what can be done on town-planning lines to restore the damaged towns of France and embellish others. Plans of Chauny, photographs of Noyon taken from an aeroplane, and plans for extensions to Paris, are some of the exhibits already placed. There are also documents dealing with the land registry and types of workmen's houses, by Greber, architect. The text of the Town-Planning Conferences held at the "Société Francaise des Urbanistes" is being published in English.

Housing Problem in England

Sir Charles Tamlin Ruthen, O.B.E., Member of the Council of the Society of Architects, read a paper* before that body in which he pointed out that even if the brick output is increased 250 per cent, it will be 15 or 20 years before the present shortage can be made good. He proposed wooden houses as a remedy, and stated that they have a life equal to that of the majority of brick houses, and that they were, of course, cheaper. He had effected a saving of about £125 on one he had built. Figures prove that more than a quarter of the population, or more than 7,000,000 persons in England, are improperly housed. He estimated that supposing the housing problem to be satisfactorily dealt with during the next five years, a total of 1,044,000 houses should be built, or considerably more than 200,000 annually. Supposing 25,000 bricks were required per house, it would mean that 5,000,000,000 bricks would be required per annum. In order to obtain this output, all other work would have to cease for the period, or the number of workmen engaged would have to equal 2½ times the number engaged in pre-war days. Even considering this, it is likely that 15 or 20 years will elapse before the shortage is remedied.

If a grave national calamity was to be averted, Sir Charles considered the following to be the five main points in house erection: Rapidity of construction, weather-proof qualities, stability, durability and cost.

The figures already stated point out the impossibility of erecting brick houses, or slow-built English types of houses. Sir Charles had studied the methods in vogue in America and Canada for some time, and had noted that many thousands of timber-built houses erected in America have lasted satisfactorily, and have had a life equal to the majority of the brick houses of Great Britain. He therefore made a demonstration of rapid-house erection near Swansea, South Wales. The houses are typical examples of American dwelling construction, adapted to English tastes. The foundations are of brick, with a bitumen damp-course, and the framework is of wood. A shield of stucco-board is secured to the framework. This consists of, first, a fibrous board on which a second material—a thick layer of asphalte mastic—is applied, and the third consists of wooden dovetailed laths embedded under great pressure into the first two. He claims for this construction a thoroughly damp-proof, warm and vermin-proof building. The external finish is stucco, and the appearance is similar to that of an ordinary brick house with a cement stucco finish. The cost of one of the houses has been £125 less than that of a similar house of 11-in. hollow brickwork. The house was completed in 30 days.

* "A New System of House Building."

Safety Education in the Public Schools

By ALBERT W. WHITNEY, *Chairman, Committee on Education, National Safety Council*

THE number of deaths due to accidents in the United States is in the neighborhood of 70,000 a year and the number of serious accidents other than death about two million. In other words, we have in our factories and streets the equivalent in their effect upon our own people of two European wars going on all the time. More specifically, the casualties due to accidents in this country during the period of our participation in the war were twice as great as the casualties to our soldiers in battle. Year in and year out there is this perpetual wastage of life and limb, this agony of torn flesh and spilt blood, this tragedy of husbands and fathers torn from their families, of little children brought lifeless or bleeding to their parents' feet. This is not a sacrifice for a principle, for liberty, for democracy, for right and truth; it is only a passionless, senseless tribute to carelessness and ignorance. A wife or mother who has given her husband or her son on a French battlefield has received some return for his life in the high emotion of the struggle for a better world, but a wife who in place of her husband receives flesh torn to pieces by the gears of a lathe or a father and mother to whom is brought the form of their child crushed under the wheels of a trolley car have no such exchange; they have only the agonized cry of wanting to know what the purport of a world can be in which such meaningless things can happen.

Much has already been done to lighten this horror. Most of the industrial plants of the country have done something to reduce their accidents and in the case of many the undertaking has been thorough and effective. Many plants have been successful in reducing their accidents to a third of what they were under old conditions. Workmen's compensation laws, which lay the responsibility for accidents directly upon the employer himself, had much to do in arousing an interest in this work, but to the credit of employers be it said that this interest once aroused has gone forward because of the driving force of the appeal of humanity and efficiency. The strength of the movement can be measured by the growth of the National Safety Council. Founded in 1912, it has now a membership representing six million of the industrial workers of the country. Its activities are having a profound effect. Until recently the work has been largely industrial, and has perforce had to do with more immediate and obvious needs, such as the mechanical guarding of machinery and the organization of shop committees. This work, however, is now so well under way that the Council can direct its efforts toward the field of public safety and toward fundamentals, and of these there is none so important as education.

The problem is at bottom a psychological one, to get people to think in terms of safety. Safety, the saving of lives and limbs, is part of the conservation movement, and conservation is a part of efficiency; engineers are thinking in terms of efficiency; they are beginning to think in terms of conservation, and this must inevitably bring with it the conservation of humanity as well as of materials and energy.

Already a number of universities have incorporated safety work in their engineering curriculum not only in connection with actual shop practice, but as a part of such courses as industrial management and machine design.

The Federal Bureau for Vocational Education has made the teaching of safety and hygiene an integral part of the work in all vocational schools. The National Safety Council, through its local councils, and the American Institute of Safety are both carrying on a most important educational work among plant inspectors and foremen.

So much, briefly, for what has been already done in the educational field outside of the public schools. It is the public school, however, that is the most fertile ground of all. If men and women are to have a regard for safety that will control their lives in an important way they must get it while they are children. The problem is therefore to introduce safety education into the schools in such a way that it shall permanently affect the child's way of thinking.

While the National Safety Council was considering how it might best attack this problem it was fortunate enough to have the problem actually solved by Dr. E. G. Payne, of Harris Teachers' College, St. Louis. What remains to be done is for the most part only to spread the news of what has been accomplished in the St. Louis schools.

The problem of introducing one more subject into an already over-crowded curriculum is something to be undertaken with respect and fear. Dr. Payne had so much respect for the feelings of teachers that he did not even attempt this. He did something different and much better; instead of introducing a new subject, safety, he introduced safety into all subjects.

May I attempt in an unprofessional way to de-

scribe the pedagogical problem? Education consists in the acquisition of certain processes, principles, and points of view that have a practical application to the business of living; it is the building up within the child of a mechanism for grasping the world. These principles cannot be taught, this mechanism cannot be built out of abstractions. The links of the mechanism must be made out of materials that are in the child's life. Principles must be pressed out of some body of experience. The more closely this body of experience approximates to the real life of the child and is in fact the real experience of the child the more effective the result will be. Not only are principles and processes thereby impressed with a vital power and meaning that they would not otherwise have, but at the same time a large body of facts and conclusions become available for application in the real business of life. In other words, the only way to learn is from life itself and the schools must be approximately a working model of life. The principles and facts of life must be got at the same time.

In primary and secondary education this principle has a respectable standing; in university education it is far from admitted, at least in general practice. There is still thought to be some virtue in pure culture, either taught in the abstract or as little contaminated as possible with practical affairs. The sooner that life is thought of as one whole and not cut up by compartments into business culture, religion, and art, the sooner we shall have a satisfactory world.

What has been done in St. Louis is to use the child's knowledge and intuition of danger and safety as a part of that body of experience out of which the educational mechanism is to be made. In this process safety takes its place only as one of a considerable number of equally important interests. Other bodies of experience which are made use of in a similar way are those arising out of the child's interest in nature, in health, in school discipline, in civic and national life, and particularly in the last two years the absorbing interests connected with the war.

The interest in safety on the part of children has probably a larger dramatic and emotional element than in the case of grown up people. We older people have many interests, such as politics, religion, art, the exigencies of making a living, that scarcely affect the child's consciousness. In our own experience life becomes so complicated by other more subtle dangers that physical danger has lost much of its poignancy. In the case of the child, however, the presence of physical danger is the cause of vivid reactions arising both out of his intuitional background and out of his reasoning.

May I, for the sake of knocking him down, erect an adversary who shall say, "The desire for safety is an ignoble motive. The very flower and savor of life is adventure. To the extent that Safety cuts adventure out of life, life becomes insipid, life is reduced to a dull monotony of material well being but of spiritual poverty."

I respect my adversary for his fine tolerance of what is merely negative; I am sorry that he has failed to see that Safety has its positive side as well as its negative side.

The confusion comes from the fact that Safety is a two-sided idea. But, like most people with two faces, it presents only one to the public. The two faces are "Safety from" and "Safety for." It is only the former idea that you are thoroughly familiar with.

Safety gets its meaning solely from the fact that life has a value. Safety has had its greatest development where life has had its greatest value. I have never known, for instance, that the safety movement has developed in India, where life is not highly valued.

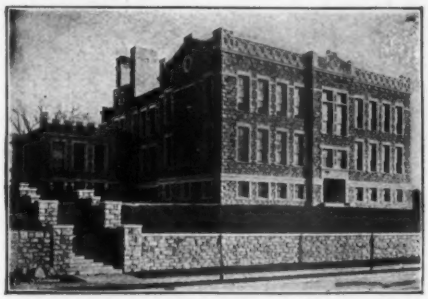
If we admit that Safety has this double aspect, then we recognize that the safety movement is not a process of deprivation, but a process of substitution. It does not deprive life of adventure, but it substitutes a worthy adventure for a mean adventure.

There is no real adventure in carelessly losing one's life under car wheels or in the gears of a machine. It is a worthy adventure to lose one's life on a battlefield in France or in piloting a way through the air across the ocean.

Life is essentially the great adventure and must continue to be so, if it is to be of any spiritual value. Safety is only a method of seeing that everybody gets his chance at a real adventure.

If this is the real mission of Safety, there can be no doubt that it is a proper subject for school instruction. May I, on this natal day of our national consciousness remind you that freedom, that liberty—those words that have kindled a hotter, more sacred fire in the hearts of men than any other words are of the same kind of safety. Freedom *from* tyranny implies freedom *for* the pursuit of a happy life.

It cannot be given all of us to fight for Freedom, but the fight for Safety, the fight for the real adventure, the fight for a life that shall be the measure of a purpose instead of the marred result of purposeless chance, is within the right of us all; it should be particularly within the right of every pupil in the public schools.



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Late Quotations in Building Material Markets

(Price quotations now current on building materials and supplies as quoted by dealers and jobbers or delivery in New York, Chicago, San Francisco Seattle, and Birmingham follow. The quotations set forth are placed before readers of THE AMERICAN ARCHITECT to afford an accurate review of market conditions, rather than for use as a basis for actual purchase. They will not only provide knowledge of the exact state of the market as to items quoted but will also present a basis to judge conditions as affecting correlating materials.)

	New York	Chicago	San Francisco	Seattle	Birmingham
BRICK					
Common	$30.45	$14.00	$16.00	$19.50	$28.00
Face brick	55.00 to 60.00	30.00 to 40.00	50.00 to 55.00	75.00	45.00
BURNED CLAY (Delivered on Job)					
Block partition:					
3 in., per sq. ft	0.13	0.10	.....	0 10½	.....
4 in., per sq. ft	0.15	0.11	.....	0 10	.....
Wall coping (single slant):					
8 in., per lin. ft	0.16	0.18	.....	.....	0.22
12 in., per ft	0.26½	0.27	.....	.....	0.32
18 in., per ft	0.54	0.54	.....	.....	0.52
(Corners and angles four times the price of one foot of coping the same size.)					
CEMENT					
Per bbl. in 15-cent bags (rebate 60 cents per bbl. for bags)	3.40	3.25	3.63	4.25	4.50
FINISHED IRON AND SUEEL (Mill Shipments)					
Bar iron, refined grade	.....	.....	.....	.....	.....
Bar iron, double refined	.....	.....	.....	.....	.....
Soft steel bars	2.62 to 4.52	.....	.....	.....	4.00
Shapes	2.72 to 4.27	.....	.....	.....	.....
GLASS (Discounts from Manufacturer's Price Lists)					
Single strength, A quality, first three brackets	75%	77%	.....	.....	.....
Single strength, B quality	75%	77%	.....	83%	.....
Double strength, A quality	77%	79%	.....	83%	.....
Double strength, B quality	79%	79%	.....	.....	.....
GYPSUM					
Plaster board:					
27x28x1	.....	.....	.....	0.46	.....
27x48x ½	0.45	.....	.....	.....	.....
32x36x ¼	0.28	0.24	.....	.....	0.40
32x36x ⅜	0.29	0.26	....	0.36	.....
32x36x ½	0.35	.....	.....	.....	.....
Plaster blocks:					
2 in. solid, 12x30, per sq. ft	0.13	0.12	.....	.....	.....
3 in. hollow, 12x30, per sq. ft	0.13	0.12	.....	.....	.....
4 in. hollow, 12x30, per sq. ft	0.14	0.13½	.....	.....	.....
6 in. hollow, 12x30, per sq. ft	0.21¾	0.20	.....	.....	.....
HOLLOW TILE					
2x 8x12 partitions, per 1,000 sq. ft	98.80-111.10	.....	80.00	.....	.....
3x12x12 partitions, per 1,000 sq. ft	148.20-165.10	110.00	108.00	105.00	112.00
4x12x12 partitions, per 1,000 sq. ft	166.70-185.70	118.00	125.00	120.00	126.00
6x12x12 partitions, per 1,000 sq. ft	222.30-247.60	162.20	154.50	170.00	168.00
8x12x12 partitions, per 1,000 sq. ft	.....	221.10	222.50	230.00	224.00
10x12x12 partitions, per 1,000 sq. ft	.....	272.70	276.00	.....	.....
12x12x12 partitions, per 1,000 sq. ft	.....	316.90	.....	.....	.....
2x12x12 split furring, per 1,000 sq. ft	92.60-103.20	73.80	108.00	.....	.....
LATH					
Eastern spruce, per thousand	18.00 to 20.00	16.00 to 18.00	20.00	14.50	.....
No. 1 white pine, per thousand	15.00 to 18.00	16.00 to 18.00	20.00	.....	.....
No 1 hemlock, per thousand	15.00 to 18.00	.....	20.00	15.00	.....
No. 1 yellow pine, per thousand	15.00 to 18.00	16.00 to 18.00	20.00	.....	20.00
LIME					
Common, 200 lb. bbls., per bbl	3.80	1.75	.....	2.85	2.50
Finishing, 300 lb. bbls., per bbl	19.50	20.00	.....	.....	2.50
Hydrated, in paper bags, per ton	4.00	.....	.....	25.00	2.50
LUMBER (Retail Prices per Thousand Delivered)					
Yellow pine, No. 1 boards, 1x6	80.00	95.00	.....	.....	120.00
Yellow pine, B, and better flooring (plain)	130.00	135.00	.....	.....	130.00
Douglas fir, 6x6 to 12x12	80.00	77.00	56.60	36.00	.....
Oak, quartered, 1 in., F. A. S.	325.00	370.00	500.00	.....	.....
Oak, plain, 1 in., F. A. S.	225.00	260.00	320.00	.....	2.70
Oak flooring, ¼ quartered, white	220.00	370.00	470.00	.....	.....
Maple, 1 in., F. A. S.	180.00	185.00	270.00	.....	.....
Maple flooring, ¼ clear	175.00	225.00	225.00	.....	.....
Mahogany, 1 in., F. A. S.	.....	400.00	500.00	.....	.....
Spruce, 10 in	85.00	80 to 140	96.00	.....	.....
Cypress, 1 in., F. A. S.	150.00	150.00	.....	.....	.....
METAL LATH					
Under 100 sq. yd., per sq. yd	0.40	.....	.....	0.40	0.42

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Late Quotations in Building Material Markets—*Continued*

	New York	Chicago	San Francisco	Seattle	Birmingham
PIPE					
Cast iron:					
6 in. and heavier	$67.30	72.00	.....	.....	66.00
4 in.	73.30	75.80	.....	.....	.....
3 in.	.....	82.80	.....	.....	.....
(And $2 additional for Class A and gas pipe)					
(Discounts to jobbers for carload lots on the Pittsburgh basing card; freight rates from Pittsburgh to New York, and also from Pittsburgh to Chicago, in carloads, per 100 lbs., are 27c. An additional 5 per cent discount is allowed to large jobbing interests over those listed below.)					
	F.O.B. Pittsburgh	F.O.B. Chicago			
	Butt Weld				
Wrought:					
Steel:					
Black, ⅛ to 3 in.	47 to 54 %	38 to 45.1%	.....	.....	.....
Galv., ⅛ to 3 in.	20½ to 41½%	10.1 to 30.1%	.....	.....	.....
Iron:					
Black, ⅛ to 1½ in.	34½%	11.9 to 22.6%	.....	.....	.....
Galv., ⅛ to 1½ in.	+25 to 18½%	+39.9 to 4.6%	.....	.....	.....
	Lap Weld				
Steel:					
Black, 2½ to 6 in.	50 %	41.1%	.....	.....	.....
Galv., 2½ to 6 in.	37½%	27.1%	.....	.....	.....
Iron:					
Black, 2½ to 6 in.	30½%	18. %	.....	.....	.....
Galv., 2½ to 6 in.	17½%	3.6%	.....	.....	.....
PLASTER					
Neat wall cement in 15-cent bags, per ton	23.50	20.00	18.50 to 20.00	24.50	24.00
Finishing plaster	25.00	20.50	19.50 to 21.00	24.00	24.00
Lath mortar, in cloth bags, per ton	16.50	.....	.....	.....	.....
RADIATION					
Discount from list on standard heights	45%	41 to 42	.....	.....	44.45
REINFORCING BARS					
High carbon steel from mill	48.50	.....	4.50 to 5.50	5.15	.....
Medium steel from mill	48.50	.....	4.50 to 5.50	.....	4.50
ROOFING MATERIAL					
Tarred felt paper:					
No. 1—25 lbs. to 100 sq. ft., per ton	81.00	90.00	.....	120	.....
No. 2—16 lbs. to 100 sq. ft., per ton	81.25	90.00	.....	110	.....
No. 3—12 lbs. to 100 sq. ft., per ton	81.63	90.00	.....	100	.....
Rosin sized sheathing, per ton	75.00	.....	.....	110	.....
Corrugated roofing, galvanized, 2½ in. corrugation, over flat sheets, per 100 lbs.	0.30	.....	.....	.....	.....
SHINGLES					
Red cedar, 5 to 2, clear, per thousand	15.00	10.00	16.00	7.25	.....
White cedar, extra star, A star, per thousand	16.00	9.50	17.00	.....	.....
SLATE ROOFING					
	F.O.B. Cars Quarry Station				
Pennsylvania:					
Best Bangor	$7.75 to $9.00	.....	.....	.....	.....	9.00 to 18.00
No. 1 Bangor Ribbon	6.75 to 7.00	.....	.....	.....	.....	.....
Pen Argyl	6.50 to 7.25	.....	.....	.....	.....	.....
Peach Bottom	10.50 to 12.50	.....	.....	.....	.....	.....
No. 1 Chapman	6.25 to 7.25	.....	.....	.....	.....	.....
Vermont:					
No. 1 Sea Green	4.25 to 6.75	.....	.....	.....	.....	27.00
Unfading Green	9.00 to 10.50	.....	.....	.....	.....	27.00
Red	12.00 to 20.00	.....	.....	.....	.....	30.00
Maine:					
Brownsville, U'f'g Black, No. 1	12.00	.....	.....	.....	.....	.....
Slaters' felt, 30 lb. roll	0.92	.....	.....	.....	.....	3.00
Slaters' felt, 40 lb. roll	1.22	.....	.....	.....	.....	3.25
STRUCTURAL STEEL					
Beams and channel, 3 to 15 in., per lb	3.47	3.47	4.50 to 5.00	4.70 to 5.00	4.70
Beams and channel, over 15 in., per lb	3.57	3.57	4.50 to 5.00	.....	.....
Angles, 3 to 6 in	3.47	3.47	4.50 to 5.00	4.10	4.70
Zees and tees	3.57	3.47 to 3.52	.....	.....	.....
Steel bars, half extras, from mill	.....	.....	4.90	4.00	4.25
STUCCO					
In cloth, per ton (white, mixed)	22.50	20.50	.....	.....	.....
STUCCO BOARD					
Medium weight stucco board, plain, per thousand sq. ft.	42.50	65.00	.....	.....	60.00
Medium weight stucco board, creosoted, per thousand sq. ft.	50.00	70.00	.....	.....	.....
Heavy weight stucco board, plain, per thousand sq. ft.	55.00	75.00	.....	.....	.....
Heavy weight stucco board, creosoted, per thousand sq. ft.	60.00	80.00	.....	.....	.....
Medium weight stucco board, plain, narrow key, per thousand sq. ft.	50.00	75.00	.....	.....	.....
Medium weight stucco board, narrow key, creosoted, per thousand sq. ft.	55.00	70.00	.....	.....	.....
Insulating board, heavy felt background, per thousand sq. ft.	50.00	70.00	.....	.....	.....
SHEATHING BOARD					
Heavy weight sheathing board, per thousand sq. ft.	50.00	70.00	.....	.....	65.00
Medium weight sheathing board, per thousand sq. ft.	46.00	63.00	.....	.....	.....
Stucco or plaster board, sheathing board and insulating board are in rolls containing one sheet 25 ft. long and 4 ft. wide (100 sq. ft.).					
WALL BOARD					
Wall board, shipped any length, 4 ft. wide, per thousand	45.00	50.00	.....	65.00	53.00
Packed flat in cars if ordered in less than car lots. Add $5.00 per thousand ft. for crating.					